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AN ECONOMIC AND STATISTICAL
ANALYSIS OF HIGHWAY-CONSTRUCTION
EXPENDITURES

By
THE BUREAU OF PUBLIC ROADS

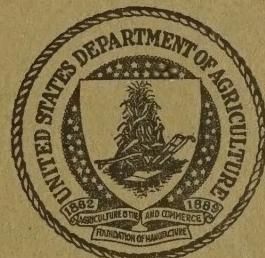
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AN ECONOMIC AND STATISTICAL ANALYSIS OF HIGHWAY-CONSTRUCTION EXPENDITURES

By the BUREAU OF PUBLIC ROADS. Report prepared by C. F. ROGERS, *associate highway engineer*, R. E. HERTEL, *assistant highway engineer*, and R. W. KRUSER, *junior highway engineer, Division of Management*

CONTENTS

| | Page |
|---|------|
| Highway construction as an employment measure during depression..... | 1 |
| The construction industry and the depression..... | 1 |
| The effect of highway construction..... | 2 |
| First distribution of expenditures for highways..... | 3 |
| Direct labor payments..... | 5 |
| Equipment costs..... | 5 |
| Material costs..... | 5 |
| Summary of distribution of direct highway expenditures..... | 6 |
| Distribution of highway expenditures to basic industries..... | 9 |
| Payments to cement industry analyzed as example of methods used..... | 14 |
| Analysis of payments to other industries..... | 15 |
| Progressive distribution of highway construction expenditures..... | 16 |
| Distribution of expenditures for consumer goods..... | 33 |
| Reinvestment of interest and margin..... | 50 |
| Employment created by highway expenditures..... | 52 |
| Value of business resulting from \$100,000,000 highway expenditure..... | 53 |
| Materials used and types of highways constructed..... | 54 |
| Bibliography..... | 55 |

HIGHWAY CONSTRUCTION AS AN EMPLOYMENT MEASURE DURING DEPRESSION

The individual activities that are comprised in our complete economic set-up are many and varied (fig. 1).¹ The forms of business and social organization are so numerous and so subject to growth and change that an occasional set-back of orderly economic progress should cause neither surprise nor bewilderment. Man's activities are mutually interdependent and when all are functioning normally they constitute a balanced economic life. When some of these activities function abnormally, progress becomes unbalanced, the course of our economic life is disturbed, and many social and economic ills ensue.

THE CONSTRUCTION INDUSTRY AND THE DEPRESSION]

The importance of the construction industry is shown by table 1.² The subnormal amount of construction activity has been coincident with and contributory to the depression. Figure 2³ shows the trend of construction activity through 1933 and clearly depicts its rise up to 1928 and subsequent collapse through 1933. Such abnormal functioning of construction activity entailed serious disturbance in other related activities and is clearly accountable as one of the major forces of depression.

¹ The basis for the preparation of fig. 1 is the Fifteenth Census of the United States, 1930, Unemployment (22).⁴ Numbers of gainful workers have been determined for the years 1925-33 by deducting current unemployment from gainful worker groups as reported by the Bureau of the Census. Data on unemployment for the years 1925-33 were obtained by means of indices of Bureau of Labor Statistics (33) composed with estimates of unemployment of the American Federation of Labor (4) and the National Industrial Conference Board (12).

² Italic numbers in parentheses refer to bibliography, p. 55.

³ Average of estimates compiled by the Federal Employment Stabilization Board based on reports to the F. W. Dodge Corporation, the Department of Agriculture, the Bureau of the Census, and the Stabilization Board.

⁴ Based on data of tables 1 and 21, fig. 1, and the Census of Construction (23). Normally, the total population of 122,000,000 persons is supported by about 47,000,000 gainful workers. Some 13,000,000 of the latter are normally engaged in construction activity and the manufacture of related producer goods. The remaining 34,000,000 gainful workers are in the consumer field engaged in the production and distribution of goods consumed by themselves, the 13,000,000 persons employed in the field of producer goods and the 75,000,000 dependent persons. Unemployment curtails average consumption and increases relative dependency. Thus, the collapse of the construction industry, which put 7,000,000 persons out of work in the producer-goods field, further caused the unemployment of 4,000,000 more in the consumer-goods field.

Public works, comprising nearly one-third of the total construction in the United States (fig. 3),⁵ at times are carried on to supplement the reduced volume of total business activity. The improvement

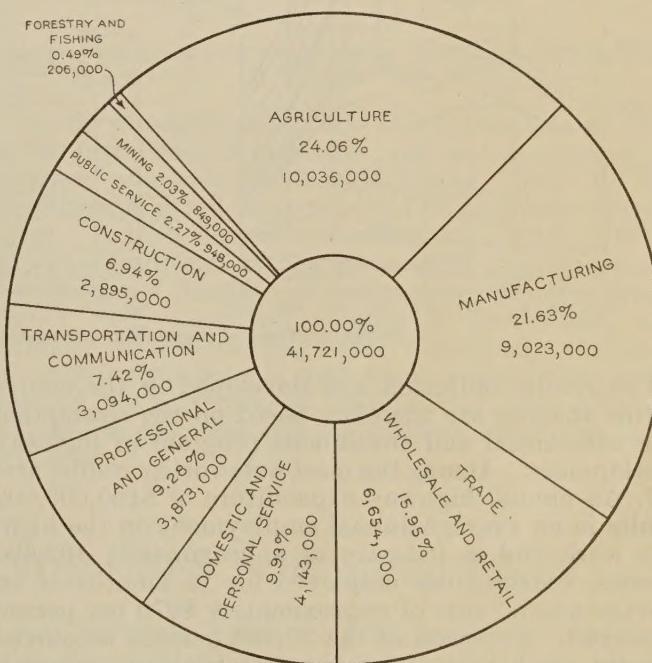


FIGURE 1.—Estimated percentage and average (1925-33) number of persons employed in the United States, distributed by groups, based on average unemployment estimates.

of highways has become one of the most important integral parts of public works. In a period of depression, highway construction looms large as a factor in the stabilization of industry and the reemployment of

⁵ From data of table 1.

labor. However, definite valuation of highway construction as a relief measure, or as an aid in the establishment of orderly economic life, is impossible in the absence of specific and accurate information, showing not only the direct or local effect of highway construction but also the indirect or auxiliary industrial effect.

THE EFFECT OF HIGHWAY CONSTRUCTION

The purpose of this report is to set forth, in considerable detail, the influence exerted by an average annual Federal and State highway program upon our economic life, assuming the work analyzed to be unaffected by abnormal years preceding or following. It is intended to present the effects of a continuing program of highway construction and such allied data as may be useful to public officials in determining highway policy.

38 hours of work per week at 59 cents per hour. The average annual wage is \$640 for job labor and \$1,170 for industrial labor.

4. Highway-construction employment is furnished in rural areas and in urban areas in the same general proportions in which unemployment exists in these areas.

5. A variety of highway types, on which the relative amounts of direct and indirect labor vary, contribute to the feasibility of adapting employment in rural and urban areas in proportion to unemployment in those areas.

6. An annual highway expenditure of \$100,000,000 initiates a movement which eventually involves, in the handling and processing of materials by industry, a total value of business transacted of approximately \$315,000,000.

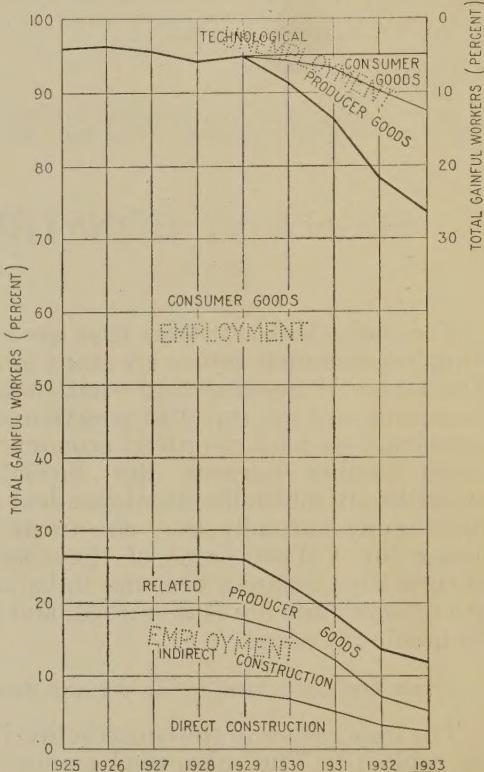
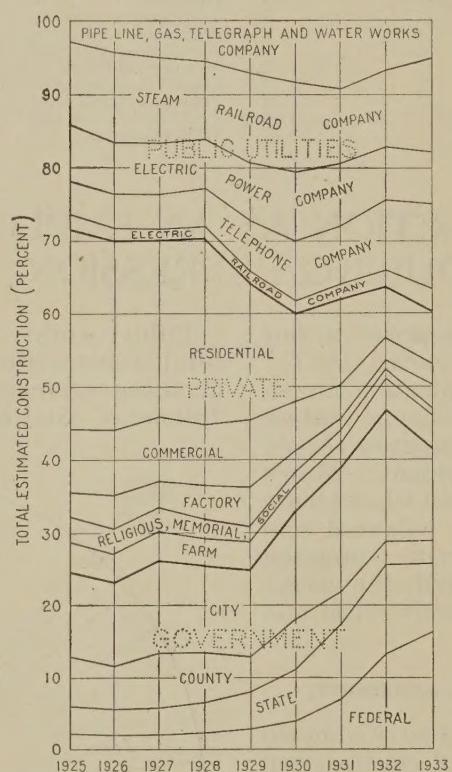
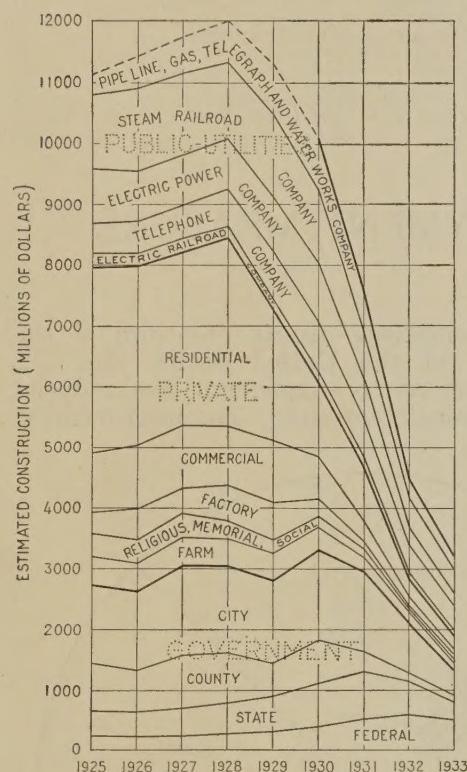


FIGURE 2.—Trend of construction and related employment data in the United States, 1925 to 1933.

The results indicated and developed in the course of this analysis are therefore based on the conception of a substantial and continuous program of highway development. Among the most noteworthy results are:

1. An annual highway expenditure of \$100,000,000 results in an average annual employment on the highway work and in industry of approximately 102,690 persons, continuously employed for 12 months at an average annual cost of approximately \$970 per person employed. For each of the 37,960 persons employed directly on highway construction projects, approximately 1.71 names of individuals appear on project pay rolls.

2. For each person employed directly on highway jobs, approximately 1.7 persons are employed indirectly in industries furnishing materials, equipment, supplies, and services.

3. The average direct worker continuously employed actually obtains 25.8 hours of work per week at 48 cents per hour. The average indirect worker obtains

7. In addition to affording economic and unemployment relief, highway construction eventually provides a connected highway system which is a distinct national asset, promoting agricultural and industrial expansion and fostering social values.

Highway expenditures are providing a connected highway system composed of various road types and containing a variety of materials. The raw materials used in highway construction have wide-spread occurrence in nature. The adaptation of these natural resources to highway use requires numerous stages of processing. Stone must be quarried, transported, crushed, separated into sizes and proportioned with other materials in proper amount. Clay must be dug and converted into brick and tile. Limestone and gypsum must be quarried and manufactured into cement and plaster. Petroleum must be produced and refined into fuels and asphalts. Iron ore must be mined and shipped, and blast furnaces and steel mills must operate to produce structural and reinforcing

TABLE 1.—*Estimated average annual construction expenditure in the United States, 1926 to 1933*

| Class of construction | Public highway | | Other | | Total |
|--------------------------------------|----------------|-------|---------------|--------|---------------|
| | | Pct. | | Pct. | |
| Federal..... | \$135,816,000 | 1.53 | \$242,309,000 | 2.73 | \$378,125,000 |
| State..... | 428,922,000 | 4.82 | 103,953,000 | 1.17 | 532,875,000 |
| County..... | 327,128,000 | 3.68 | 200,497,000 | 2.25 | 527,625,000 |
| City..... | 457,311,000 | 5.14 | 735,064,000 | 8.26 | 1,192,375,000 |
| Total, Government..... | 1,349,177,000 | 15.17 | 1,281,823,000 | 14.41 | 2,631,000,000 |
| Residential..... | | | 1,712,250,000 | 19.25 | |
| Commercial..... | | | 665,625,000 | 7.48 | |
| Factory..... | | | 334,125,000 | 3.76 | |
| Farm..... | | | 352,625,000 | 3.97 | |
| Religious, memorial, and social..... | | | 213,875,000 | 2.40 | |
| Total, private..... | | | 3,278,500,000 | 36.86 | |
| Steam railroad..... | | | 1,031,875,000 | 11.60 | |
| Electric power company..... | | | 694,375,000 | 7.81 | |
| Telephone company..... | | | 588,125,000 | 6.61 | |
| Pipe line company..... | | | 1,309,750,000 | 3.48 | |
| Electric railroad company..... | | | 167,750,000 | 1.89 | |
| Gas company..... | | | 1,133,750,000 | 1.50 | |
| Telegraph company..... | | | 1,36,750,000 | .41 | |
| Waterworks company..... | | | 1,23,000,000 | .26 | |
| Total, public utilities..... | | | 2,985,375,000 | 33.56 | |
| Grand total..... | | | 8,894,875,000 | 100.00 | |

¹ Averages are based on data for years 1930-33.

steel. Cotton must be grown, ginned, and woven into fabric for tires and containers. Coal must be mined, and timber felled and milled. Finally, these materials must be concentrated in various proportions at numerous sites of construction and, after the application of a high degree of mechanization in the direct construction operation, they emerge in the finished highway.

Throughout this succession of processing stages use is made of tremendous resources in the form of plant and equipment, which, in a continuous program of highway construction, undergo steady depreciation and require maintenance, repair, and replacement of buildings, machinery, and tools on account of wear and tear and obsolescence.

These requirements of highway construction cause business transactions in addition to the highway business transacted on the job. Each order for highway materials initiates the transaction of business in numerous places and in many industries. An order for steel requires the application of labor and equipment to materials purchased by steel mills from blast-furnace operators and other sources. Pig-iron manufacture causes the transaction of business in the conversion of iron ore, requiring the application of additional labor

to plant and equipment. The transportation of iron ore from the mines adds to the value of business already transacted. Finally, the mining of the iron ore further increases the value of business transacted. Each successive stage in the processing of materials represents the distribution of expense to labor, equipment, materials, and other expense, which items compose the cost of doing business. The total value of business thus transacted is the sum of the separate values involved in the several stages required for the complete processing of materials.

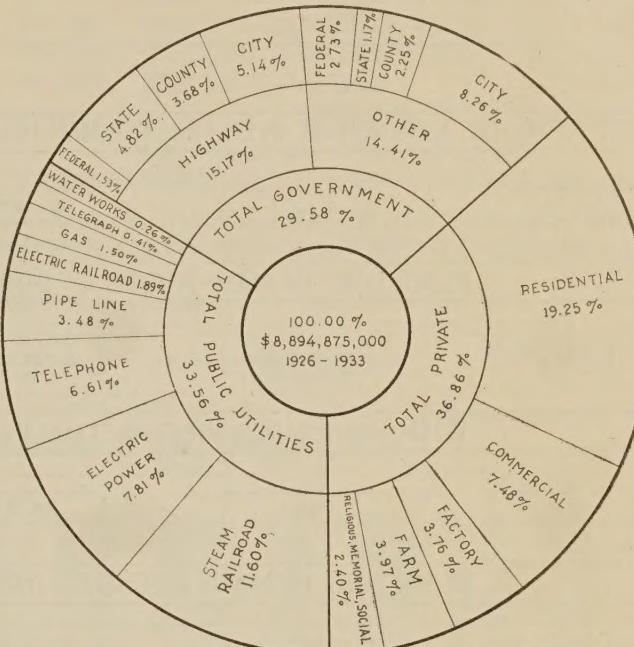


FIGURE 3—Distribution of the average (1926-33) annual construction expenditure in the United States.

Sound management directs the application of labor in the processing of materials, and makes efficient use of every available mechanical means. Only by this combination is full value received for highway expenditures. A high degree of mechanical efficiency is an important adjunct of the agencies of production and distribution. Sacrifice of mechanical efficiency means higher cost, decreased volume of production, and ultimate reduction in pay rolls. Conversely, the use of efficient machinery and methods in construction mean lowered costs, increased productivity, and ultimate increase in pay rolls and the greatest return for funds expended.

FIRST DISTRIBUTION OF EXPENDITURES FOR HIGHWAYS

In analyzing highway expenditures a step-by-step procedure was carried on until all of an original \$100,000,000 expenditure had been distributed as salaries and wages to labor. The procedure involved, as a first step, the segregation of salaries and wages paid to direct labor on construction projects. In the next step distribution is made to producer-goods industries of all other expense, and, in the progressive distribution of this expense the salaries and wages paid to indirect labor are segregated. The remainder of the industrial expense incident to the original highway expenditure is composed of interest and margin

items, definitely forming a field for the reinvestment of payments made to large and small income groups. The third step traces payments which form a part of large incomes and which are reinvested in producer-goods industries (not unlike the original producer-goods investment), and also traces small incomes expended for the cost of living in the purchase of consumer goods (represented by retail trade). Ultimately, the entire original highway expenditure is distributed as salaries and wages and become labor's share in the total value of business thus created.

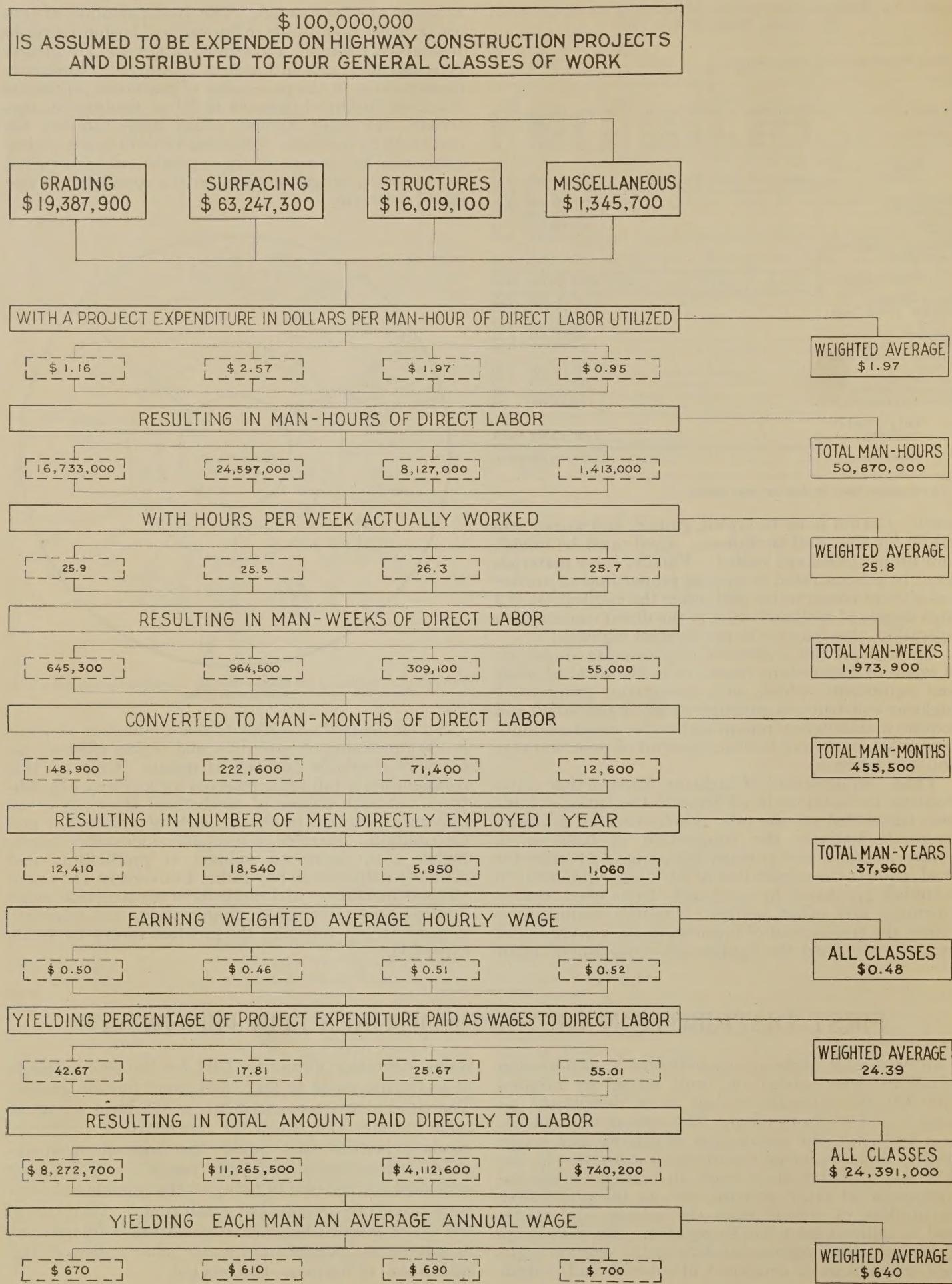


FIGURE 4.—Direct employment created by \$100,000,000 highway construction expenditure.

DIRECT LABOR PAYMENTS

Labor first shares in the initial or direct highway construction operation. The break-down of the direct operation expense into its elements is based on analysis of regular and special monthly field reports made to the Bureau of Public Roads by resident engineers and contractors on active construction projects.

Figure 4 summarizes the data concerning the direct or job labor. These data are derived from monthly field reports and from certified copies of contractor's pay rolls filed by contractors for each pay-roll period and summarized to show by projects the number of men employed, man-hours, and wages on the \$120,000,000 Federal emergency highway construction program. Project data were assembled by States and by classes of work and totaled by sections of the United States, for the entire country, and for all classes of work. In addition, employment was distributed by months of the year to show the effects of weather limitations (fig. 5). There has been some distortion in seasonal employment in recent years because of the

classes using factors derived in field cost studies by the Bureau of Public Roads. Depreciation was calculated

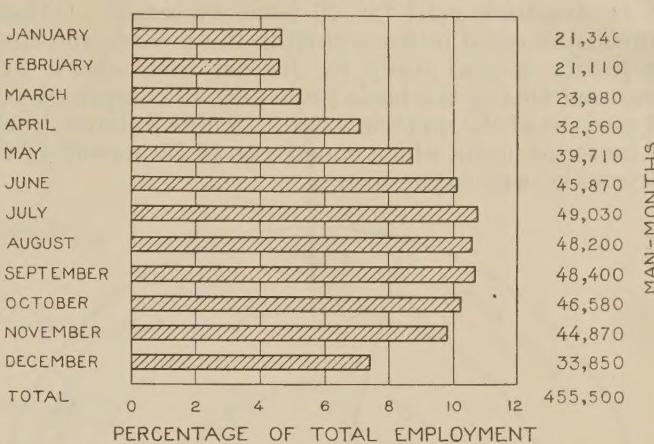


FIGURE 5.—Monthly distribution of highway construction employment.

by methods recommended by the Bureau of Internal Revenue and the Associated General Contractors 45, (6).

TABLE 2.—Equipment expense for \$100,000,000 highway construction expenditure

| Type of equipment | Total cost of equipment | Annual depreciation and transportation costs | | | Annual charge for repairs and replacements | | | Interest | Insurance | Taxes |
|---|-------------------------|--|----------------|-------------|--|----------------|-------------|-----------|-----------|----------|
| | | Depreciation | Transportation | Total | Repairs and replacements | Transportation | Total | | | |
| Power shovels, cranes, and draglines | \$11,485,000 | \$1,468,900 | \$139,300 | \$1,608,200 | \$1,545,800 | \$13,200 | \$1,559,000 | \$293,800 | \$60,700 | \$60,700 |
| Graders and scrapers | 2,720,000 | 396,400 | 39,300 | 435,700 | 417,100 | 3,600 | 420,700 | 79,300 | 16,400 | 16,400 |
| Drilling equipment | 1,483,000 | 214,400 | 7,900 | 222,300 | 225,700 | 1,900 | 227,600 | 42,900 | 8,900 | 8,900 |
| Concrete-paving equipment | 3,554,000 | 576,900 | 49,600 | 626,500 | 607,200 | 5,200 | 612,400 | 115,400 | 23,900 | 23,900 |
| Bituminous-paving equipment | 1,545,000 | 207,300 | 11,000 | 218,300 | 218,200 | 1,900 | 220,100 | 41,500 | 8,600 | 8,600 |
| Tractors | 5,061,000 | 705,300 | 41,300 | 746,600 | 742,200 | 6,300 | 748,500 | 141,000 | 29,200 | 29,200 |
| Trucks | 16,574,000 | 2,482,300 | 69,600 | 2,551,900 | 2,612,400 | 22,300 | 2,634,700 | 496,400 | 102,700 | 102,700 |
| Other hauling equipment | 2,341,000 | 395,500 | 41,700 | 437,200 | 416,300 | 3,600 | 419,900 | 79,100 | 16,400 | 16,400 |
| Culvert and bridge equipment | 1,506,000 | 237,500 | 11,600 | 249,100 | 250,000 | 2,100 | 252,100 | 47,500 | 9,800 | 9,800 |
| Pumping equipment | 865,000 | 142,500 | 42,600 | 185,100 | 150,000 | 1,300 | 151,300 | 28,500 | 5,900 | 5,900 |
| Crushing, screening, and conveyor equipment | 698,000 | 100,000 | 12,200 | 112,200 | 105,200 | 900 | 106,100 | 20,000 | 4,100 | 4,100 |
| Total | 47,832,000 | 6,927,000 | 466,100 | 7,393,100 | 7,290,100 | 62,300 | 7,352,400 | 1,385,400 | 286,600 | 286,600 |
| Percentage distribution of totals | | 93.70 | 6.30 | 100.00 | 99.15 | 0.85 | 100.00 | ----- | ----- | ----- |

| Type of equipment | Fuel charge | | | Lubricants charge | | | Total equipment charge | | |
|---|-------------|----------------|-----------|-------------------|----------------|-----------|------------------------|----------------|-------------|
| | Fuel | Transportation | Total | Lubricants | Transportation | Total | Equipment | Transportation | Total |
| Power shovels, cranes, and draglines | \$285,600 | \$174,400 | \$460,000 | \$83,000 | \$52,400 | \$135,400 | \$3,798,500 | \$379,300 | \$4,177,800 |
| Graders and scrapers | 2,400 | 1,400 | 3,800 | 8,400 | 5,300 | 13,700 | 936,400 | 49,600 | 986,000 |
| Drilling equipment | 112,500 | 68,800 | 181,300 | 31,600 | 20,000 | 51,600 | 644,900 | 98,600 | 743,500 |
| Concrete-paving equipment | 73,700 | 45,100 | 118,800 | 40,600 | 25,700 | 66,300 | 1,461,600 | 125,600 | 1,587,200 |
| Bituminous-paving equipment | 158,200 | 96,700 | 254,900 | 5,200 | 3,200 | 8,400 | 647,600 | 112,800 | 760,400 |
| Tractors | 201,100 | 122,900 | 324,000 | 26,500 | 16,700 | 43,200 | 1,874,500 | 187,200 | 2,061,700 |
| Trucks | 1,450,600 | 886,400 | 2,337,000 | 207,400 | 131,100 | 338,500 | 7,454,500 | 1,109,400 | 8,563,900 |
| Other hauling equipment | 600 | 300 | 900 | 11,700 | 7,400 | 19,100 | 936,000 | 53,000 | 989,000 |
| Culvert and bridge equipment | 34,600 | 21,200 | 55,800 | 5,300 | 3,300 | 8,600 | 594,500 | 38,200 | 632,700 |
| Pumping equipment | 59,400 | 36,300 | 95,700 | 7,900 | 5,000 | 12,900 | 400,100 | 85,200 | 485,300 |
| Crushing, screening, and conveyor equipment | 29,900 | 18,200 | 48,100 | 3,900 | 2,500 | 6,400 | 267,200 | 33,800 | 301,000 |
| Total | 2,408,600 | 1,471,700 | 3,880,300 | 431,500 | 272,600 | 704,100 | 19,015,800 | 2,272,700 | 21,288,500 |
| Percentage distribution of totals | 62.07 | 37.93 | 100.00 | 61.28 | 38.72 | 100.00 | 89.32 | 10.68 | 100.00 |

emphasis placed on winter work to relieve unemployment. Figure 4 shows that direct or job labor receives 24.39 percent of the direct highway expenditure.

EQUIPMENT COSTS

Table 2 summarizes the data concerning the equipment used. These data were derived from monthly field reports from active construction projects in the form of an inventory of equipment in use on Federal and State work costing \$263,000,000. Valuation, ownership expense, and cost of operation of equipment were calculated by units and applied to equipment

Table 2 shows the total cost of equipment, annual charge for depreciation, repair and replacement, interest, insurance, taxes, and supply items, together with the pertinent transportation items. The total charge for equipment is shown to be 21.29 percent of the direct highway expenditure.

MATERIAL COSTS

Table 3 shows the actual outlays for basic materials. These outlays are based on reported data for individual projects on the \$120,000,000 Federal emergency highway program and totaled for the United States. Data

reported included quantities, source, distance moved, type of haul, cost at source, hauling charge, and cost at contractor's yard for 10 basic materials. Miscellaneous material items occurring in amounts too small to justify special study for further break-down were prorated among the basic items, which comprised over 97 percent of the materials cost. Table 3 shows details of materials costs which constitute 48.75 percent of the direct highway expenditure.

projects previously made by the Bureau. These other expenses amount to 5.57 percent of the direct highway expenditure.

SUMMARY OF DISTRIBUTION OF DIRECT HIGHWAY EXPENDITURES

The highway industry may now be summarized in terms of all general items composing the direct project expenditure as follows:

| Item: | Percent |
|---------------|---------|
| Labor | 24.39 |
| Equipment | 21.29 |
| Materials | 48.75 |
| Other expense | 5.57 |
| Total | 100.00 |

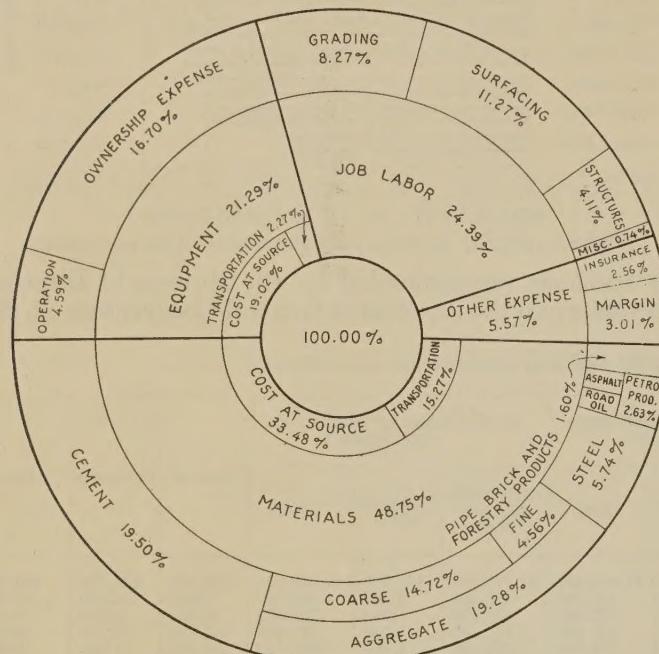


FIGURE 6.—Distribution of highway construction expenditures.

Other expense attached to highway construction includes bond premium, compensation and liability insurance, and taxes and margin, data concerning which were derived from cost studies of construction

Subdivisions of these items of direct cost are shown graphically in figure 6. The percentages shown hold fairly constant from year to year for the entire field of highway construction.

Variation in types of road and in sectional practices produce differences in cost, but in a large program many of the differences tend to cancel each other with the result that variations from the percentages in figure 6 are not large.

A period of high labor cost produces increased mechanical efficiency to increase output and results in approximately the same percentage payment to labor. Substantial increase in labor cost is usually accompanied by a proportional increase in the cost of other items, which in the final analysis are the result of labor costs. Thus the volume purchased by a given expenditure may vary but the expense items, expressed as percentages, remain substantially uniform from year to year.

Figure 7 shows the distribution of equipment expense. Similarly figure 8 shows the distribution of materials expense. These figures enable ready determination of the relative importance of the major subdivisions of highway costs.

TABLE 3.—Materials expense for \$100,000,000 highway construction expenditure

| Material | Quantity | Weight | Distance moved | Haul | Hauling cost | | | Cost at source | | Total cost at road plant | | |
|--|------------------|----------------|----------------|-----------------------|--------------|--------------|----------|----------------|----------|--------------------------|----------|---------------------|
| | | | | | Amount | Per ton-mile | Per unit | Amount | Per unit | Amount | Per unit | Proportion of total |
| Fine aggregate..... tons ¹ | Number 4,776,000 | Tons 4,776,000 | Miles 35 | Ton-miles 167,173,000 | \$2,429,900 | \$0.0145 | \$0.0508 | \$2,128,300 | \$0.446 | \$4,558,200 | \$0.954 | 9.35 |
| Coarse aggregate..... do. ² | 18,192,000 | 18,192,000 | 18 | 335,498,000 | 5,628,200 | .0168 | .309 | 9,092,000 | .500 | 14,720,200 | .809 | 30.20 |
| Cement..... barrels..... | 10,433,700 | 1,961,600 | 184 | 360,017,000 | 5,169,500 | .0144 | .495 | 14,332,600 | 1.374 | 19,502,100 | 1.869 | 40.01 |
| Iron and steel..... pounds..... | 214,005,000 | 107,000 | 472 | 50,494,000 | 927,500 | .0184 | .004 | 4,811,700 | .023 | 5,739,200 | .027 | 11.77 |
| Road oil..... gallons..... | 22,207,000 | 77,800 | 369 | 28,656,000 | 484,100 | .0169 | .022 | 747,900 | .034 | 1,232,000 | .056 | 2.53 |
| Asphalt..... do. ³ | 21,353,000 | 89,200 | 313 | 27,894,000 | 396,200 | .0142 | .019 | 1,004,600 | .047 | 1,400,800 | .066 | 2.87 |
| Lumber..... M feet b. m..... | 18,060 | 30,200 | 485 | 14,637,000 | 113,500 | .0078 | 6.281 | 534,600 | 29.597 | 648,100 | 35.878 | 1.33 |
| Brick..... thousands..... | 4,080 | 19,800 | 4 | 79,000 | 6,100 | .0771 | 1.500 | 97,900 | 23.998 | 104,000 | 25.498 | .21 |
| Pipe..... lineal feet..... | 1,038,600 | 14,500 | 236 | 3,432,000 | 116,400 | .0339 | .112 | 727,500 | .701 | 843,900 | .813 | 1.73 |
| Total..... | | 25,268,100 | 39 | 987,880,000 | 15,271,400 | .0155 | | 33,477,100 | | 48,748,500 | | 100.00 |

¹ Sand.

² Gravel and crushed stone.

³ Includes 1,426,885 gallons of tar; total cost, \$128,530.

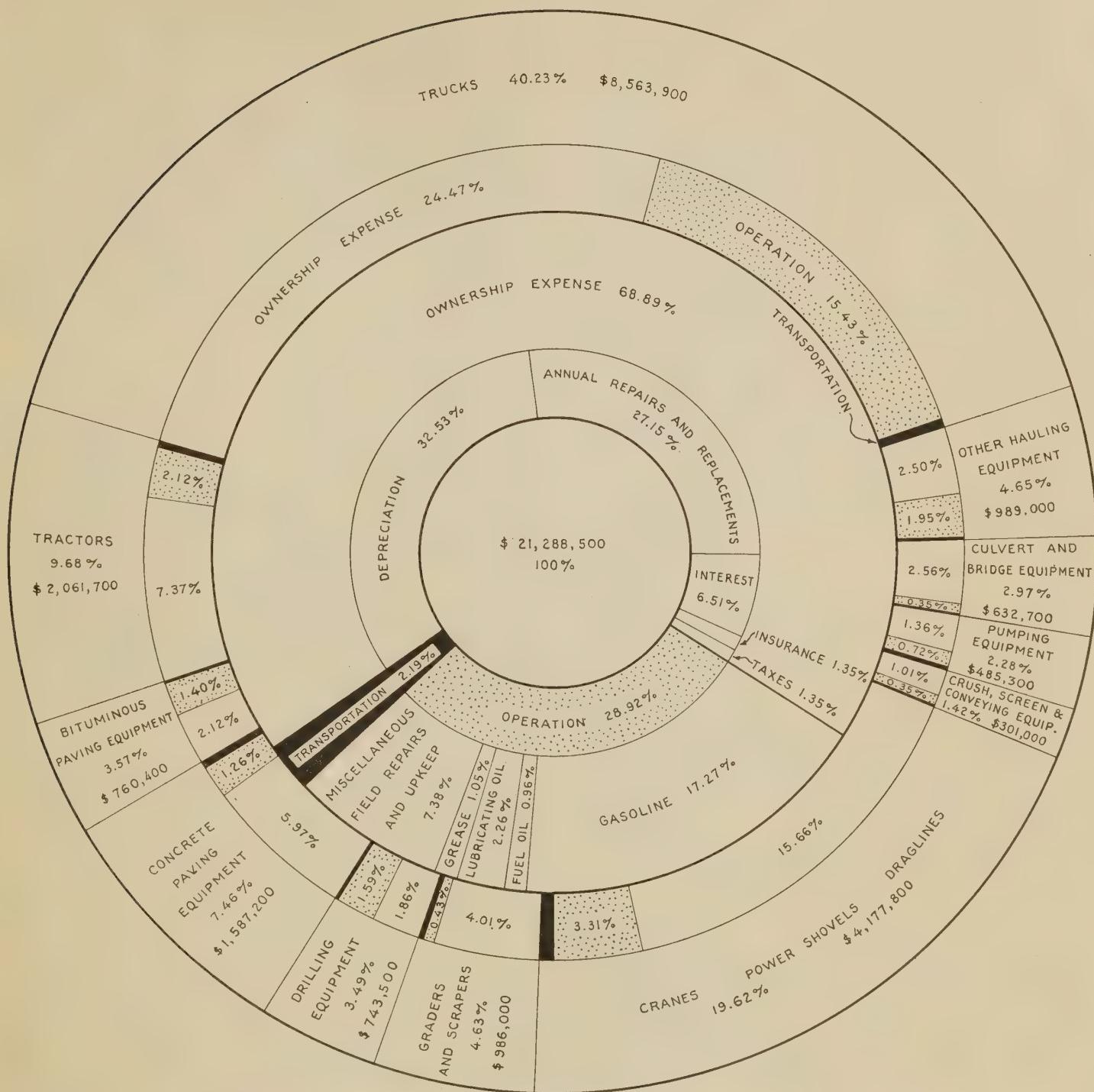


FIGURE 7.—Distribution of equipment expense for \$100,000,000 highway construction expenditure. Stippling indicates operation costs and black indicates transportation costs.

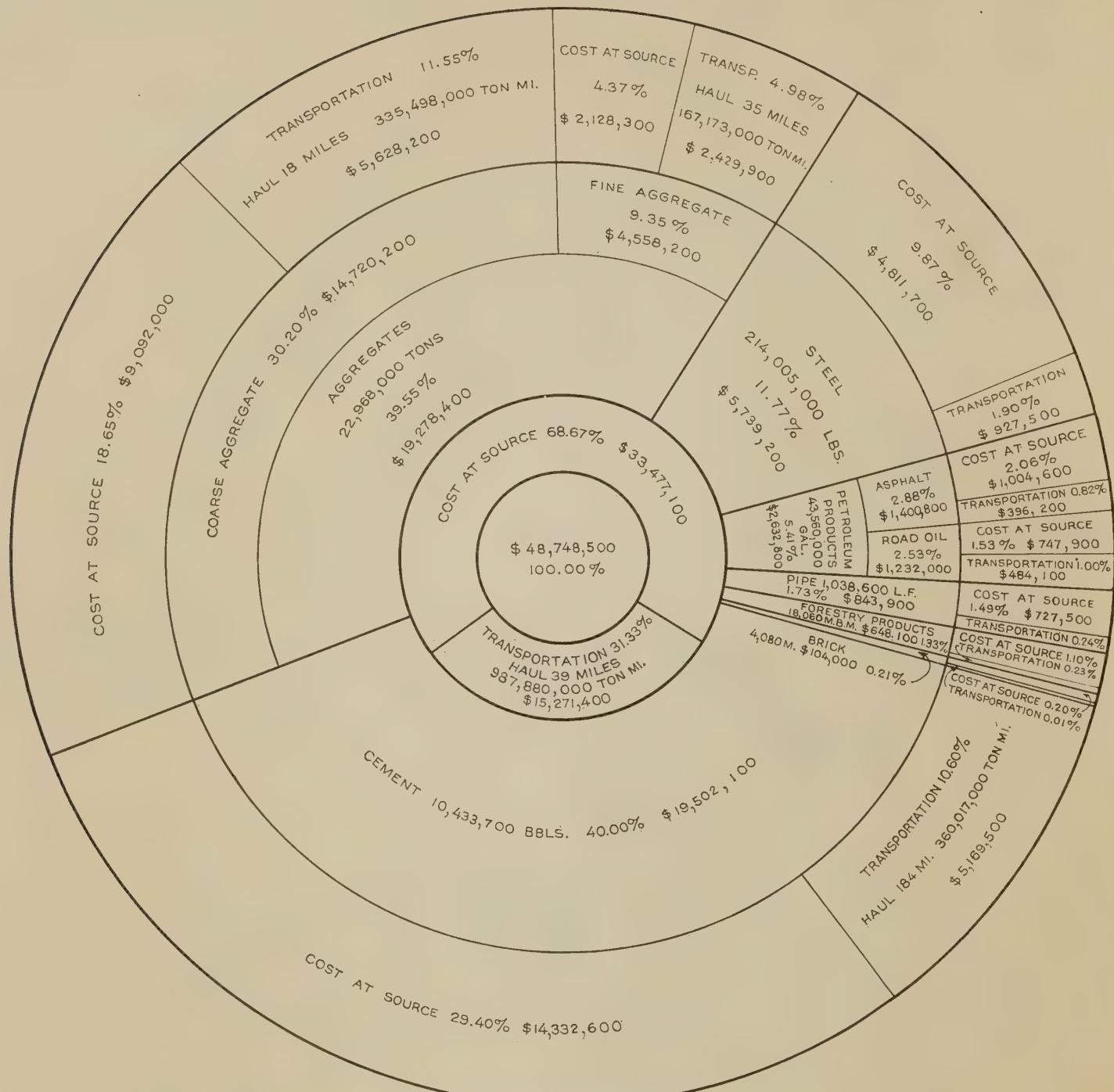


FIGURE 8.—Distribution of material expense for \$100,000,000 highway construction expenditure.

DISTRIBUTION OF HIGHWAY EXPENDITURES TO BASIC INDUSTRIES

Break-down no. 1 of table 4 shows the final detailed subdivision of the direct highway expenditure. Payments as salaries and wages on the job and for equipment, materials, and supplies are shown. As a basis for later analysis of these payments, break-downs 2 to 24 of table 5 show percentages derived for basic industries and applicable to the items of break-down no. 1. In deriving these percentages the general outline of break-down no. 1 was followed.

Each break-down carries the items "salaries and wages", "interest", and "margin." In later analysis the last two items are recapitulated separately for distribution as reinvestment. The transportation items of break-down no. 1 are later consolidated with other transportation items and distributed according to the percentages of break-down no. 2.

TABLE 4.—*Analysis of highway expenditure of \$100,000,000*BREAK-DOWN NO. 1—DIRECT HIGHWAY EXPENDITURE OF
\$100,000,000

| Item | At source | Transportation | Item total |
|---------------------------------------|-------------|----------------|--------------|
| Salaries and wages..... | | | \$24,391,000 |
| Equipment: | | | |
| Ownership expense: | | | |
| Depreciation..... | \$6,927,000 | \$466,100 | 7,393,100 |
| Repair and replacement..... | 7,290,100 | 62,300 | 7,352,400 |
| Interest..... | | | 1,385,400 |
| Insurance..... | | | 286,600 |
| Taxes..... | | | 286,600 |
| Operating expense—Petroleum products: | | | |
| Fuel..... | 2,408,600 | 1,471,700 | 3,880,300 |
| Lubricants..... | 431,500 | 272,600 | 704,100 |
| Total..... | | | 21,288,500 |
| Materials: | | | |
| Aggregate, quarrying..... | 11,220,300 | 8,058,100 | 19,278,400 |
| Cement..... | 14,332,600 | 5,169,500 | 19,502,100 |
| Iron and steel..... | 4,811,700 | 927,500 | 5,739,200 |
| Petroleum products..... | 1,752,500 | 880,300 | 2,632,800 |
| Pipe..... | 727,500 | 116,400 | 843,900 |
| Forestry products..... | 534,600 | 113,500 | 648,100 |
| Brick..... | 97,900 | 6,100 | 104,000 |
| Total..... | | | 48,748,500 |
| Other expense: | | | |
| Insurance: | | | |
| Bond premium..... | | | 1,500,000 |
| Compensation and liability..... | | | 609,800 |
| Taxes..... | | | 450,100 |
| Margin..... | | | 3,012,100 |
| Total..... | | | 5,572,000 |
| Industry total..... | | | 17,544,100 |
| | | | 100,000,000 |

TABLE 5.—*Analysis of expenditures of basic industries on a percentage basis*

BREAK-DOWN NO. 2—TRANSPORTATION

| Item | At source | Transportation | Total |
|---------------------------------|-----------|----------------|---------|
| | Percent | Percent | Percent |
| Salaries and wages..... | | | 51.76 |
| Equipment: | | | |
| Ownership expense: | | | |
| Interest..... | | | 4.16 |
| Taxes..... | | | 1.55 |
| Insurance..... | | | 1.54 |
| Operating expense: | | | |
| Petroleum products: | | | |
| Fuel..... | 0.27 | (1) | .27 |
| Lubricants..... | .15 | | .15 |
| Coal and coke..... | 3.12 | | 3.12 |
| Power..... | | | .39 |
| Total..... | | | 11.18 |
| Materials: | | | |
| Iron and steel..... | 10.58 | | 10.58 |
| Forestry products..... | 1.65 | | 1.65 |
| Nonferrous-metals refining..... | .38 | | .38 |
| Aggregate, quarrying..... | .27 | | .27 |
| Brick..... | .22 | | .22 |

TABLE 5.—*Analysis of expenditures of basic industries on a percentage basis—Continued*

BREAK-DOWN NO. 2—TRANSPORTATION—Continued

| Item | At source | Transportation | Total |
|---|-----------|----------------|---------|
| | Percent | Percent | Percent |
| Materials—Continued. | | | |
| Cement..... | 0.18 | | 0.18 |
| Aggregate..... | .10 | | .10 |
| Total..... | | | 13.38 |
| Other expense: | | | |
| Insurance—Compensation and liability..... | | | 1.83 |
| Taxes..... | | | 4.22 |
| Laboratory..... | | | 1.09 |
| Advertising and development..... | | | 2.17 |
| Margin..... | | | 14.37 |
| Total..... | | | 23.68 |
| Industry total..... | | | 100.00 |

BREAK-DOWN NO. 3—PLANT AND EQUIPMENT EXPENDITURE FOR DEPRECIATION, REPAIR, AND REPLACEMENT

| | | | |
|----------------------------------|-------|------|--------|
| Salaries and wages..... | | | 40.31 |
| Equipment: | | | |
| Ownership expense: | | | |
| Interest..... | | | 4.73 |
| Insurance..... | | | .95 |
| Taxes..... | | | .86 |
| Operating expense: | | | |
| Petroleum products: | | | |
| Fuel..... | 0.45 | 0.27 | .72 |
| Lubricants..... | .20 | .14 | .34 |
| Coal and coke..... | .25 | .30 | .55 |
| Power..... | | | .64 |
| Total..... | | | 8.79 |
| Materials: | | | |
| Iron and steel..... | 12.75 | .82 | 13.57 |
| Rubber..... | 5.15 | .22 | 5.37 |
| Forestry products..... | 3.06 | .68 | 3.74 |
| Cement..... | 1.34 | .49 | 1.83 |
| Brick..... | 1.65 | .10 | 1.75 |
| Nonferrous-metals refining..... | 1.60 | .03 | 1.63 |
| Aggregate, quarrying..... | .80 | .57 | 1.37 |
| Total..... | | | 29.26 |
| Other expense: | | | |
| Insurance: | | | |
| Bond premium..... | | | .12 |
| Compensation and liability..... | | | .88 |
| Taxes..... | | | 1.87 |
| Advertising and development..... | | | 1.90 |
| Laboratory..... | | | .93 |
| Margin..... | | | 16.44 |
| Total..... | | | 21.64 |
| Industry total..... | | | 3.62 |
| | | | 100.00 |

BREAK-DOWN NO. 4—AGGREGATE, QUARRYING

| | | | |
|---|-------|------|--------|
| Salaries and wages..... | | | 41.74 |
| Equipment: | | | |
| Ownership expense: | | | |
| Depreciation..... | | | 7.29 |
| Repair and replacement..... | 10.25 | 0.52 | 10.77 |
| Interest..... | | | 2.43 |
| Insurance..... | | | .49 |
| Taxes..... | | | .49 |
| Operating expense: | | | |
| Petroleum products: | | | |
| Fuel..... | 1.38 | .84 | 2.22 |
| Lubricants..... | 1.40 | .97 | 2.37 |
| Coal and coke..... | .75 | .93 | 1.68 |
| Power..... | | | 4.81 |
| Total..... | | | 32.55 |
| Materials—Explosives..... | 12.53 | .84 | 13.37 |
| Other expense: | | | |
| Insurance—Compensation and liability..... | | | .84 |
| Taxes..... | | | 2.20 |
| Laboratory..... | | | 1.08 |
| Advertising and development..... | | | 2.84 |
| Margin..... | | | 5.38 |
| Total..... | | | 12.34 |
| Industry total..... | | | 4.10 |
| | | | 100.00 |

¹ Expenditure for transportation included in other items of transportation breakdown.

ANALYSIS OF HIGHWAY-CONSTRUCTION EXPENDITURES

TABLE 5.—*Analysis of expenditures of basic industries on a percentage basis—Continued*

BREAK-DOWN NO. 5—INSURANCE AND TAXES

| Item | At source | Transportation | Total | | | |
|--------------------------|-----------|----------------|--------|---------|---------|---------|
| | | | | Percent | Percent | Percent |
| Salaries and wages..... | | | 47.00 | | | |
| Plant and equipment..... | 32.20 | 7.80 | 40.00 | | | |
| Interest..... | | | 13.00 | | | |
| Industry total..... | | 7.80 | 100.00 | | | |

BREAK-DOWN NO. 6—CEMENT

| | | | | | | |
|---|------|-------|--------|--|--|--|
| Salaries and wages..... | | | 24.94 | | | |
| Equipment: | | | | | | |
| Ownership expense: | | | | | | |
| Depreciation..... | | | 6.95 | | | |
| Repair and replacement..... | 8.75 | 0.44 | 9.19 | | | |
| Interest..... | | | 5.94 | | | |
| Insurance..... | | | 1.19 | | | |
| Taxes..... | | | 1.19 | | | |
| Operating expense: | | | | | | |
| Petroleum products: | | | | | | |
| Fuel..... | 1.85 | 1.12 | 2.97 | | | |
| Lubricants..... | 1.59 | .99 | 2.58 | | | |
| Coal and coke..... | 4.99 | 6.21 | 11.20 | | | |
| Power..... | | | 5.79 | | | |
| Total..... | | | 47.00 | | | |
| Materials: | | | | | | |
| Aggregate, quarrying..... | 6.68 | 1.35 | 8.03 | | | |
| Metallic-ore mining..... | 1.22 | 1.25 | 2.47 | | | |
| Explosives..... | 1.38 | .09 | 1.47 | | | |
| Containers..... | .87 | .06 | .93 | | | |
| Total..... | | | 12.90 | | | |
| Other expense: | | | | | | |
| Insurance—Compensation and liability..... | | | .47 | | | |
| Taxes..... | | | 2.00 | | | |
| Laboratory..... | | | 3.85 | | | |
| Advertising and development..... | | | 1.14 | | | |
| Margin..... | | | 7.70 | | | |
| Total..... | | | 15.16 | | | |
| Industry total..... | | 11.51 | 100.00 | | | |

BREAK-DOWN NO. 7—IRON AND STEEL

| | | | | | | |
|---|-------|-------|--------|--|--|--|
| Salaries and wages..... | | | 22.67 | | | |
| Equipment: | | | | | | |
| Ownership expense: | | | | | | |
| Depreciation..... | | | 4.97 | | | |
| Repair and replacement..... | 4.60 | 0.23 | 4.83 | | | |
| Interest..... | | | 2.65 | | | |
| Insurance..... | | | .55 | | | |
| Taxes..... | | | .55 | | | |
| Operating expense: | | | | | | |
| Petroleum products: | | | | | | |
| Fuel..... | .69 | .42 | 1.11 | | | |
| Lubricants..... | .36 | .23 | .59 | | | |
| Coal and coke..... | 8.97 | 7.27 | 16.24 | | | |
| Power..... | | | .85 | | | |
| Total..... | | | 32.34 | | | |
| Materials: | | | | | | |
| Metallic-ore mining..... | 17.85 | 10.71 | 28.56 | | | |
| Nonferrous-metals refining..... | 4.45 | .08 | 4.53 | | | |
| Aggregate, quarrying..... | 1.49 | .30 | 1.79 | | | |
| Total..... | | | 34.88 | | | |
| Other expense: | | | | | | |
| Insurance—Compensation and liability..... | | | .49 | | | |
| Taxes..... | | | .87 | | | |
| Laboratory..... | | | 1.00 | | | |
| Advertising and development..... | | | 1.08 | | | |
| Margin..... | | | 6.67 | | | |
| Total..... | | | 10.11 | | | |
| Industry total..... | | 19.24 | 100.00 | | | |

BREAK-DOWN NO. 8—PETROLEUM PRODUCTS

| | | | | | | |
|-----------------------------|-------|------|-------|--|--|--|
| Salaries and wages..... | | | 29.80 | | | |
| Equipment: | | | | | | |
| Ownership expense: | | | | | | |
| Depreciation..... | | | 12.81 | | | |
| Repair and replacement..... | 10.39 | 0.51 | 10.90 | | | |
| Interest..... | | | 5.48 | | | |
| Insurance..... | | | 1.12 | | | |
| Taxes..... | | | 1.11 | | | |

TABLE 5.—*Analysis of expenditures of basic industries on a percentage basis—Continued*

BREAK-DOWN NO. 8—PETROLEUM PRODUCTS—Continued

| Item | At source | Transportation | Total | | | |
|---|-----------|----------------|-------|---------|---------|---------|
| | | | | Percent | Percent | Percent |
| Equipment—Continued. | | | | | | |
| Operating expense: | | | | | | |
| Coal and coke..... | 0.13 | 0.20 | 0.33 | | | |
| Power..... | | | .28 | | | |
| Total..... | | | | | | 32.03 |
| Materials: | | | | | | |
| Crude oil (petroleum products)..... | | | | (2) | | |
| Containers..... | 2.10 | .14 | .24 | | | |
| Nonferrous-metals refining..... | .77 | .40 | 1.17 | | | |
| Total..... | | | | | | 18.61 |
| Other expenses: | | | | | | |
| Insurance—Compensation and liability..... | | | | | | .39 |
| Taxes..... | | | | | | 2.45 |
| Laboratory..... | | | | | | 1.78 |
| Advertising and development..... | | | | | | 1.88 |
| Margin..... | | | | | | 13.06 |
| Total..... | | | | | | 19.56 |
| Industry total..... | | | | | 16.45 | 100.00 |

BREAK-DOWN NO. 9—COAL AND COKE

| | | | | | | |
|----------------------------------|------|------|-------|------|--|--------|
| Salaries and wages..... | | | 61.42 | | | |
| Equipment: | | | | | | |
| Ownership expense: | | | | | | |
| Depreciation..... | | | | | | |
| Repair and replacement..... | 5.66 | 0.29 | 5.95 | | | |
| Interest..... | | | | | | 5.13 |
| Insurance..... | | | | | | 1.02 |
| Taxes..... | | | | | | 1.02 |
| Operating expense: | | | | | | |
| Petroleum products: | | | | | | |
| Fuel..... | .62 | .39 | 1.01 | | | |
| Lubricants..... | .38 | .23 | .61 | | | |
| Power..... | | | | | | 2.57 |
| Total..... | | | | | | 27.81 |
| Materials—Explosives..... | | 1.47 | .10 | | | 1.57 |
| Other expense: | | | | | | |
| Insurance..... | | | | | | 1.41 |
| Taxes..... | | | | | | 1.10 |
| Advertising and development..... | | | | | | .59 |
| Margin..... | | | | | | 6.10 |
| Total..... | | | | | | 9.20 |
| Industry total..... | | | | 1.01 | | 100.00 |

BREAK-DOWN NO. 10—POWER

| | | | | | | |
|---|------|------|-------|------|--|--------|
| Salaries and wages..... | | | 21.65 | | | |
| Equipment: | | | | | | |
| Ownership expense: | | | | | | |
| Depreciation..... | | | | | | |
| Repair and replacement..... | 6.81 | 0.35 | 7.16 | | | |
| Interest..... | | | | | | 15.88 |
| Insurance..... | | | | | | 1.27 |
| Taxes..... | | | | | | 5.22 |
| Operating expense: | | | | | | |
| Petroleum products: | | | | | | |
| Fuel..... | 1.37 | .82 | 2.19 | | | |
| Lubricants..... | .81 | .50 | 1.31 | | | |
| Coal and coke..... | 3.02 | 1.51 | 4.53 | | | |
| Total..... | | | | | | 43.89 |
| Other expense: | | | | | | |
| Insurance—Compensation and liability..... | | | | | | .29 |
| Taxes..... | | | | | | 3.63 |
| Advertising and development..... | | | | | | 2.59 |
| Margin..... | | | | | | 27.95 |
| Total..... | | | | | | 34.46 |
| Industry total..... | | | | 3.18 | | 100.00 |

BREAK-DOWN NO. 11—METALLIC-ORE MINING

| | | | | | | |
|-----------------------------|------|------|-------|--|--|--|
| Salaries and wages..... | | | 35.87 | | | |
| Equipment: | | | | | | |
| Ownership expense: | | | | | | |
| Depreciation..... | | | | | | |
| Repair and replacement..... | 5.46 | 0.28 | 5.74 | | | |

^a Expenditure for petroleum products at source included in other items of petroleum products break-down. Similarly, expenditures for other products at source are included in other items of their respective breakdowns.

DISTRIBUTION OF HIGHWAY EXPENDITURES TO BASIC INDUSTRIES

11

TABLE 5.—*Analysis of expenditures of basic industries on a percentage basis—Continued*

BREAK-DOWN NO. 11—METALLIC-ORE MINING—Continued

| Item | At source | Transportation | Total |
|--------------------------------------|-----------|----------------|---------|
| | Percent | Percent | Percent |
| Equipment—Continued. | | | |
| Ownership expense—Continued. | | | |
| Interest | | .36 | |
| Insurance | | .63 | |
| Taxes | | .63 | |
| Operating expense: | | | |
| Petroleum products: | | | |
| Fuel | 1.89 | 1.15 | 3.04 |
| Lubricants | 1.12 | .70 | 1.82 |
| Coal and coke | 1.03 | 1.27 | 2.20 |
| Power | | | 6.59 |
| Total | | | 32.26 |
| Materials: | | | |
| Metallic-ore mining | | 4.24 | 4.24 |
| Explosives | 11.42 | .74 | 12.16 |
| Total | | | 16.40 |
| Other expense: | | | |
| Insurance—Compensation and liability | | .72 | |
| Taxes | | .78 | |
| Advertising and development | | 2.72 | |
| Margin | | 11.25 | |
| Total | | | 15.47 |
| Industry total | | 8.38 | 100.00 |

BREAK-DOWN NO. 12—FORESTRY PRODUCTS

| | | | |
|--------------------------------------|------|------|--------|
| Salaries and wages | | | 52.99 |
| Equipment: | | | |
| Ownership expense: | | | |
| Depreciation | | | 3.17 |
| Repair and replacement | 7.49 | 0.37 | 7.86 |
| Interest | | | 3.16 |
| Insurance | | | .63 |
| Taxes | | | .63 |
| Operating expense: | | | |
| Petroleum products: | | | |
| Fuel | .79 | .48 | 1.27 |
| Lubricants | .59 | .36 | .95 |
| Coal and coke | 1.51 | 1.86 | 3.37 |
| Power | | | 4.47 |
| Total | | | 25.51 |
| Materials—Forestry products | | 5.42 | 5.42 |
| Other expense: | | | |
| Insurance—Compensation and liability | | | 1.38 |
| Taxes | | | 2.74 |
| Advertising and development | | | 1.84 |
| Margin | | | 10.12 |
| Total | | | 16.08 |
| Industry total | | 8.49 | 100.00 |

BREAK-DOWN NO. 13—ADVERTISING AND DEVELOPMENT

| | | | |
|--------------------------------------|------|------|--------|
| Salaries and wages | | | 37.48 |
| Equipment: | | | |
| Ownership expense: | | | |
| Depreciation | | | 16.41 |
| Repair and replacement | 9.69 | 0.48 | 10.17 |
| Interest | | | 5.85 |
| Taxes | | | 1.17 |
| Insurance | | | 1.17 |
| Operating expense: | | | |
| Petroleum products: | | | |
| Fuel | .85 | .52 | 1.37 |
| Lubricants | .46 | .32 | .78 |
| Coal and coke | .62 | .77 | 1.39 |
| Power | | | 5.81 |
| Total | | | 44.12 |
| Materials: | | | |
| Advertising and development | | .46 | .46 |
| Forestry products | 7.48 | .91 | 8.39 |
| Total | | | 8.85 |
| Other expense: | | | |
| Insurance—Compensation and liability | | | .51 |
| Taxes | | | 1.06 |
| Margin | | | 7.98 |
| Total | | | 9.55 |
| Industry total | | 3.46 | 100.00 |

TABLE 5.—*Analysis of expenditures of basic industries on a percentage basis—Continued*

BREAK-DOWN NO. 14—EXPLOSIVES

| Item | At source | Transportation | Total |
|--------------------------------------|-----------|----------------|---------|
| | Percent | Percent | Percent |
| Salaries and wages | | | |
| Equipment: | | | |
| Ownership expense: | | | |
| Depreciation | | | 12.41 |
| Repair and replacement | | 10.03 | 0.50 |
| Interest | | | 10.53 |
| Insurance | | | 5.05 |
| Taxes | | | 1.61 |
| Operating expense: | | | |
| Petroleum products: | | | |
| Fuel | | .74 | .44 |
| Lubricants | | .44 | .27 |
| Coal and coke | | .95 | 1.17 |
| Power | | | 1.40 |
| Total | | | 36.62 |
| Materials: | | | |
| Explosives | | | 8.64 |
| Aggregate, quarrying | | 10.97 | 2.90 |
| Container | | 2.10 | .14 |
| Total | | | 24.75 |
| Other expense: | | | |
| Insurance—Compensation and liability | | | .40 |
| Taxes | | | 2.69 |
| Laboratory | | | .75 |
| Advertising and development | | | 1.23 |
| Margin | | | 13.01 |
| Total | | | 18.08 |
| Industry total | | | 14.06 |
| BREAK-DOWN NO. 15—LABORATORY | | | |

| | | | |
|--------------------------------------|--|------|--------|
| Salaries and wages | | | 37.03 |
| Equipment: | | | |
| Ownership expense: | | | |
| Depreciation | | | 6.38 |
| Repair and replacement | | 4.94 | 0.25 |
| Interest | | | 5.19 |
| Insurance | | | 4.57 |
| Taxes | | | .76 |
| Operating expense: | | | |
| Petroleum products: | | | |
| Fuel | | .23 | .14 |
| Lubricants | | .09 | .06 |
| Coal and coke | | .16 | .19 |
| Power | | | .52 |
| Total | | | 19.07 |
| Materials: | | | |
| Iron and steel | | | 16.40 |
| Nonferrous-metals refining | | 7.29 | .13 |
| Aggregate, quarrying | | 3.53 | 1.83 |
| Total | | | 29.18 |
| Other expense: | | | |
| Insurance—Compensation and liability | | | .72 |
| Taxes | | | 1.32 |
| Advertising and development | | | 1.56 |
| Margin | | | 11.12 |
| Total | | | 14.72 |
| Industry total | | 5.14 | 100.00 |

BREAK-DOWN NO. 16—RUBBER

| | | | |
|------------------------|--|-------|-------|
| Salaries and wages | | | 21.09 |
| Equipment: | | | |
| Ownership expense: | | | |
| Depreciation | | | 7.30 |
| Repair and replacement | | 4.17 | 0.21 |
| Interest | | | 4.38 |
| Insurance | | | 2.09 |
| Taxes | | | .42 |
| Operating expense: | | | |
| Petroleum products: | | | |
| Fuel | | .03 | .02 |
| Lubricants | | .02 | .01 |
| Coal and coke | | .28 | .34 |
| Power | | | .71 |
| Total | | | 16.02 |
| Materials: | | | |
| Agricultural products: | | | |
| Cotton fabric | | 19.50 | .86 |
| Crude rubber | | 27.53 | 1.53 |
| Total | | | 20.36 |
| Industry total | | | 29.06 |

TABLE 5.—*Analysis of expenditures of basic industries on a percentage basis—Continued*

BREAK-DOWN NO. 16—RUBBER—Continued

| Item | At source | Transportation | Total |
|--------------------------------------|-----------|----------------|---------|
| | Percent | Percent | Percent |
| Materials—Continued. | | | |
| Aggregate, quarrying | 2.50 | 1.30 | 3.80 |
| Total | | | 53.22 |
| Other expense: | | | |
| Insurance—Compensation and liability | | | .42 |
| Taxes | | | .88 |
| Laboratory | | | 1.47 |
| Advertising and development | | | 1.21 |
| Margin | | | 5.69 |
| Total | | | 9.67 |
| Industry total | | | 4.27 |
| | | | 100.00 |

BREAK-DOWN NO. 17—BRICK

| | | | |
|--------------------------------------|------|------|--------|
| Salaries and wages | | | 46.52 |
| Equipment: | | | |
| Ownership expense: | | | |
| Depreciation | | | 4.60 |
| Repair and replacement | 5.27 | 0.27 | 5.54 |
| Interest | | | 3.29 |
| Insurance | | | .66 |
| Taxes | | | .66 |
| Operating expense: | | | |
| Petroleum products: | | | |
| Fuel | 2.48 | 1.52 | 4.00 |
| Lubricants | 1.36 | .83 | 2.19 |
| Coal and coke | 3.30 | 4.10 | 7.40 |
| Power | | | 3.46 |
| Total | | | 31.80 |
| Other expense: | | | |
| Insurance—Compensation and liability | | | .98 |
| Taxes | | | 2.20 |
| Advertising and development | | | 2.70 |
| Laboratory | | | 1.18 |
| Margin | | | 14.62 |
| Total | | | 21.68 |
| Industry total | | | 6.72 |
| | | | 100.00 |

BREAK-DOWN NO. 18—AGRICULTURAL PRODUCTS

| | | | |
|------------------------|-------|------|--------|
| Salaries and wages | | | 24.23 |
| Equipment: | | | |
| Ownership expense: | | | |
| Depreciation | | | 13.75 |
| Repair and replacement | 19.05 | 0.98 | 20.03 |
| Interest | | | 13.68 |
| Taxes | | | 6.48 |
| Insurance | | | 1.40 |
| Operating expense: | | | |
| Petroleum products: | | | |
| Fuel | 2.82 | 1.72 | 4.54 |
| Lubricants | .44 | .30 | .74 |
| Power | | | 2.67 |
| Total | | | 63.29 |
| Other expense: | | | |
| Taxes | | | .60 |
| Margin | | | 11.88 |
| Total | | | 12.48 |
| Industry total | | | 3.00 |
| | | | 100.00 |

BREAK-DOWN NO. 19—PIPE

| | | | |
|--------------------------|------|------|-------|
| Salaries and wages | | | 18.58 |
| Equipment: | | | |
| Ownership expense: | | | |
| Depreciation | | | 4.61 |
| Repair and replacement | 2.74 | 0.13 | 2.87 |
| Interest | | | 2.30 |
| Insurance | | | .46 |
| Taxes | | | .46 |
| Operating expense: | | | |
| Petroleum products: | | | |
| Fuel | .48 | .29 | .77 |
| Lubricants | .23 | .15 | .38 |
| Power | | | 1.30 |
| Total | | | 13.15 |
| Materials—Iron and steel | | | 45.78 |
| | | | 8.40 |
| | | | 54.18 |

TABLE 5.—*Analysis of expenditures of basic industries on a percentage basis—Continued*

BREAK-DOWN NO. 19—PIPE—Continued

| Item | At source | Transportation | Total |
|--------------------------------------|-----------|----------------|---------|
| | Percent | Percent | Percent |
| Other expense: | | | |
| Insurance—Compensation and liability | | | 0.38 |
| Taxes | | | 2.20 |
| Advertising and development | | | 4.99 |
| Margin | | | 6.52 |
| Total | | | 14.09 |
| Industry total | | | 8.97 |
| | | | 100.00 |

BREAK-DOWN NO. 20—NONFERROUS-METALS REFINING

| | | | |
|--------------------------------------|--|------|--------|
| Salaries and wages | | | 9.19 |
| Equipment: | | | |
| Ownership expense: | | | |
| Depreciation | | | 3.23 |
| Repair and replacement | | 2.11 | 2.22 |
| Interest | | | 1.22 |
| Insurance | | | .24 |
| Taxes | | | .24 |
| Operating expense: | | | |
| Petroleum products: | | | |
| Fuel | | .72 | .44 |
| Lubricants | | .39 | .25 |
| Coal and coke | | .88 | 1.07 |
| Power | | | .81 |
| Total | | | 11.71 |
| Materials—Metallic-ore mining | | | 64.29 |
| | | | 8.93 |
| | | | 73.22 |
| Other expense: | | | |
| Insurance—Compensation and liability | | | .18 |
| Taxes | | | .30 |
| Laboratory | | | .27 |
| Advertising and development | | | .78 |
| Margin | | | 4.35 |
| Total | | | 5.88 |
| Industry total | | | 10.80 |
| | | | 100.00 |

BREAK-DOWN NO. 21—CONTAINERS

| | | | |
|--------------------------------------|--|-------|--------|
| Salaries and wages | | | 21.07 |
| Equipment: | | | |
| Ownership expense: | | | |
| Depreciation | | 3.35 | 0.16 |
| Repair and replacement | | | 3.51 |
| Interest | | | 1.83 |
| Taxes | | | .36 |
| Insurance | | | .36 |
| Operating expense: | | | |
| Petroleum products: | | | |
| Fuel | | .12 | .07 |
| Lubricants | | .06 | .04 |
| Coal and coke | | .14 | .17 |
| Power | | | .83 |
| Total | | | 11.00 |
| Materials: | | | |
| Iron and steel | | 28.03 | 1.81 |
| Lumber | | 14.65 | 1.78 |
| Nonferrous-metals refining | | .52 | .01 |
| Agricultural products—Cotton fabric | | 10.91 | .49 |
| Total | | | 58.20 |
| Other expense: | | | |
| Insurance—Compensation and liability | | | .43 |
| Taxes | | | 2.07 |
| Advertising and development | | | .43 |
| Margin | | | 6.80 |
| Total | | | 9.73 |
| Industry total | | | 4.53 |
| | | | 100.00 |

BREAK-DOWN NO. 22—RETAIL TRADE

| | | | |
|------------------------|--|------|-------|
| Salaries and wages | | | 14.28 |
| Equipment: | | | |
| Ownership expense: | | | |
| Depreciation | | 2.24 | 0.12 |
| Repair and replacement | | | 2.37 |
| Interest | | | 1.17 |
| Taxes | | | .26 |
| Insurance | | | .25 |
| Operating expense: | | | |
| Petroleum products: | | | |
| Fuel | | .18 | .10 |
| Lubricants | | .03 | .02 |
| Total | | | .28 |
| | | | .05 |

TABLE 5.—*Analysis of expenditures of basic industries on a percentage basis—Continued*

BREAK-DOWN NO. 22—RETAIL TRADE—Continued

| Item | At source | Transportation | Total |
|------------------------------|-----------|----------------|---------|
| | | | Percent |
| Equipment—Continued. | | | |
| Operating expense—Continued. | | | |
| Power | | | 1.05 |
| Total | | | 7.79 |
| Materials—Wholesale trade | 60.18 | 11.58 | 71.76 |
| Other expense: | | | |
| Insurance and taxes | | | .75 |
| Advertising and development | | | .13 |
| Margin | | | 5.29 |
| Total | | | 6.17 |
| Industry total | | 11.82 | 100.00 |

BREAK-DOWN NO. 23—WHOLESALE TRADE

| | | | |
|--------------------------------------|-------|------|--------|
| Salaries and wages | | | 7.80 |
| Equipment: | | | |
| Ownership expense: | | | |
| Depreciation | | | 3.00 |
| Repair and replacement | 2.87 | 0.13 | |
| Interest | | | 2.48 |
| Taxes | | | .60 |
| Insurance | | | .59 |
| Operating expense: | | | |
| Petroleum products: | | | |
| Fuel | .38 | .17 | .55 |
| Lubricants | .06 | .04 | .10 |
| Power | | | 1.76 |
| Total | | | 12.08 |
| Materials: | | | |
| Manufacturing | 50.40 | 2.60 | 53.00 |
| Agricultural products | 8.62 | .22 | 8.84 |
| Metallic-ore mining | 2.01 | .08 | 2.09 |
| Petroleum products | 1.07 | .08 | 1.15 |
| Forestry products | .92 | .06 | .98 |
| Total | | | 66.06 |
| Other expense: | | | |
| Insurance—Compensation and liability | | | .19 |
| Taxes | | | 1.68 |
| Advertising and development | | | 1.67 |
| Margin | | | 10.52 |
| Total | | | 14.06 |
| Industry total | | 3.38 | 100.00 |

BREAK-DOWN NO. 24—MANUFACTURING

| | | | |
|--------------------------------------|-------|------|--------|
| Salaries and wages | | | 31.51 |
| Equipment: | | | |
| Ownership expense: | | | |
| Depreciation | | | 7.53 |
| Repairs and replacement | 7.29 | 0.24 | |
| Interest | | | 8.90 |
| Taxes | | | .89 |
| Insurance | | | .89 |
| Operating expense: | | | |
| Petroleum products: | | | |
| Fuel | 1.06 | .14 | 1.20 |
| Lubricants | .18 | .03 | .21 |
| Coal and coke | 2.04 | .51 | 2.55 |
| Power | | | .93 |
| Total | | | 30.63 |
| Materials: | | | |
| Agricultural products | 19.26 | .44 | 19.70 |
| Petroleum products | 2.04 | .26 | 2.30 |
| Metallic-ore mining | 4.49 | .16 | 4.65 |
| Forestry products | 2.06 | .13 | 2.19 |
| Total | | | 28.84 |
| Other expense: | | | |
| Insurance—Compensation and liability | | | .79 |
| Taxes | | | .90 |
| Advertising and development | | | 1.28 |
| Margin | | | 6.05 |
| Total | | | 9.02 |
| Industry total | | 1.91 | 100.00 |

The basic industries covered by break-downs 2 to 24 were selected on the assumption that a reasonable number of industries of general scope would be prefer-

able to a great number of limited scope. The arrangement used greatly simplified the subsequent processes of distribution without substantially affecting the accuracy necessary to establish justifiable conclusions. Under this arrangement, highway-construction materials, such as road oil, asphalt, and supplies used in equipment operation such as gasoline, fuel oil, and lubricants, are all classed as petroleum products and are assigned to a general industry of that name covering the general field of production and refining. The basic industries first selected, together with the expense items assigned to them, are as follows:

Aggregate (quarrying):

Fine aggregate.
Coarse aggregate.

Cement.

Iron and steel:
Reinforcing steel.
Structural steel.

Petroleum products:

Road oil.
Asphalt.
Gasoline.
Fuel oil.
Lubricants.

Forestry products:

Lumber.
Paper products.

Brick.

Culvert pipe.

Insurance and taxes:
Compensation insurance.
Bond premium.
Taxes.

Plant and equipment:
Depreciation.
Repair and replacement.

In furnishing the needs of highway construction, these industries incur expenses for salaries and wages, equipment, supplies, materials, and other items. Purchases are made from other industries in sufficient amounts to justify their analysis in tracing the effect of highway expenditures. The cement and aggregate industries carry on quarrying and must purchase powder and blasting supplies from the explosives industry. Tires and rubber goods must be purchased from the rubber industry for plant and equipment use. The need for cotton fabric for tires and for cotton sacks in the cement industry introduces both the container industry and agricultural products. The steel and explosives industries purchase ores and bring mining into the field. Most concerns set aside funds for research and for advertising and development. These industries, together with the former group, comprise the basic industries studied in tracing the highway expenditure back to the farms, forests, mines, and quarries.

The percentage distribution of industrial expense varies widely between periods of prosperity and of depression. The percentage distribution of industrial expense used in this analysis is intended to represent that made in average establishments over a period of years. The industry break-downs therefore reflect the items of actual expense based on a normal supply and a normal demand. The effects of peak production, utilization of products from storage, and reduction or disappearance of margin in periods of depression have been eliminated. The result calculated in this manner is that of a long-time trend in which industries operate at a normal rate in producing goods used in highway construction.

Break-downs nos. 2 to 24 of table 5 show the percentage distribution of all items of expense for the several industries involved. The break-down of each industry is assigned a number. The references used in making the break-downs are given in the bibliography. Information was drawn from various sources and was not always consistent. Minor variations in the several subdivisions of an industry are inconsequential in light of later distributions, which tend to dissipate error by successive division rather than to accumulate it.

PAYMENTS TO CEMENT INDUSTRY ANALYZED AS EXAMPLE OF METHODS USED

The cement industry (break-down no. 6) is taken as an example of the procedure used in the break-down. Table 4 shows that the cement costs about \$19,000,000 of the \$100,000,000 expenditure for highways. Of this amount about \$5,000,000 is for transportation, leaving about \$14,000,000 that is spent directly for cement. Fourteen million dollars will purchase about 10,000,000 barrels of cement. The analysis of the cost of manufacturing 10,000,000 barrels of cement is typical of the procedure used in all the break-downs.

The Census of Manufactures of the United States Department of Commerce (17, 25) provides data that enable the subdivision of the value of portland cement (natural, puzzolan, etc., cements excluded) into general expense items. It is found that an average of the data on value of product and on volume of business for the years 1927 and 1931 closely approximates the estimated normal in this industry. In these 2 years, over 300,000,000 barrels of cement having a total value of nearly \$430,000,000 were shipped. Table 6 shows the division of payments to this industry into general items.

TABLE 6.—General expense items of the cement industry for years 1927 and 1931 combined

| Item | Total expenditure | Cost per barrel | Percentage of sale price | | |
|---|-------------------|-----------------|--------------------------|-------|---------|
| | | | Dollars | Cents | Percent |
| Salaries | 26,556,500 | 8.52 | 8.20 | | |
| Wages | 80,301,400 | 25.75 | 18.74 | | |
| Materials and containers | 84,093,200 | 26.97 | 19.63 | | |
| Fuel and power | 85,537,300 | 27.44 | 19.96 | | |
| Profits and production costs ¹ | 151,902,800 | 48.72 | 35.47 | | |
| Total | 428,391,200 | 137.40 | 100.00 | | |

¹ Includes expense items such as depreciation, interest, margin, insurance, taxes, rent, advertising, development, and other miscellaneous items.

With the exception of salaries and wages, the general items can be broken down into raw materials, manufactured and semimanufactured products of other industries, insurance and taxes, interest, and margin. In this analysis, only the more important items entering into the cost of the finished product are considered. A detailed treatment of the cost of materials and supplies would include dozens of minor items that would have a negligible effect but would greatly complicate the analysis.

Table 7 shows the division of wages in the cement industry according to types of work performed based on data published by the Bureau (9).

TABLE 7.—Division of wages in the cement industry

| Operation | Wages per barrel of cement | Percentage of sale price | |
|----------------------|----------------------------|--------------------------|---------|
| | | Cents | Percent |
| Manufacturing | 10.69 | 7.78 | |
| Quarrying | 5.02 | 3.65 | |
| Packing and shipping | 3.78 | 2.75 | |
| Repairs | 2.54 | 1.85 | |
| Power | 2.50 | 1.82 | |
| Laboratory | 1.22 | .89 | |
| Total | 25.75 | 18.74 | |

The fuel and power item shown in table 6 is distributed to other industries in table 8. The distribution is based on data from the report Cement Industry (37) and from the Census of Manufactures (25).

TABLE 8.—Cost of fuel and power per barrel of cement

| Item | Unit price | Per barrel of cement | | Percentage of sale price |
|------------------|--------------------------------|----------------------|-------|--------------------------|
| | | Quantity | Cost | |
| Coal | \$2.85 per ton | 107.9 pounds | 15.39 | 11.20 |
| Natural gas | \$0.107 per 1,000 cubic feet | 249.8 cubic feet | 2.67 | 1.94 |
| Oil and gasoline | \$0.025 per gallon | 0.6 gallon | 1.42 | 1.03 |
| Power | \$0.882 per 100 kilowatt-hours | 9.02 kilowatt-hours | 7.96 | 5.79 |
| Total | | | 27.44 | 19.96 |

Under the item "materials and containers" there are included the costs of cement rock or limestone and clay, gypsum, and explosives, as well as supplies other than the fuel and power needed to operate the cement mill. The average quantities of material per barrel of cement were determined from Mineral Resources of the United States (29, 30). By applying average prices of the materials to their quantities, the cost and percentage of the total cost of cement represented by materials can be determined. Table 9 shows the cost of materials and mill supplies required per barrel of cement.

TABLE 9.—Cost of materials and mill supplies per barrel of cement

| Item | Unit price | Per barrel of cement | | Percentage of sale price |
|--|------------|----------------------|-------|--------------------------|
| | | Quantity | Cost | |
| Cement rock or limestone and clay ¹ | \$0.50 | 0.221 ton | 11.03 | 8.03 |
| Gypsum | 5.00 | 0.0068 ton | 3.39 | 2.47 |
| Explosives | 13.65 | 0.148 pound | 2.02 | 1.47 |
| Containers | | | 1.28 | 0.93 |
| Total | | | 17.72 | 12.90 |
| Materials and containers (from table 6.) | | | 26.97 | 19.63 |
| Balance for mill supplies | | | 9.25 | 6.73 |

¹ Per ton.

² Per 100 pounds.

The general item "profits and production costs" of table 6 plus the "balance for mill supplies" of table 9 represents ownership expense of the plant, repair and replacement, and other expense, such as insurance and taxes, laboratory, advertising and development, and margin.

Depreciation and repair and replacement represent the cost to a manufacturer of maintaining his plant at a constant value. The value of the operating cement plants is placed at about \$350,000,000. If these plants have an average life of 15 years, a charge of 16.45 cents per barrel is necessary with an average annual production of 130,000,000 barrels to replace the plant exclusive of land costs (9 percent of total plant value).

With the exception of lubricants, the charge for mill supplies can be classed as repair and replacement. Table 10 shows the costs of depreciation and repair and replacement per barrel of cement produced.

TABLE 10.—*Cost of depreciation and repair and replacement per barrel of cement*

| Item | Cost per barrel | Percent-age of sale price |
|--|-----------------|---------------------------|
| | Cents | Percent |
| Mill supplies..... | 9.25 | 6.73 |
| Lubricants ¹ | 3.54 | 2.58 |
| Repair and replacement from mill supplies..... | 5.71 | 4.15 |
| Depreciation and other repair and replacement..... | 16.45 | 11.99 |
| Total..... | 22.16 | 16.14 |

¹ Deduct from mill supplies to derive repair and replacement cost.

No sharp line of demarcation exists between the cost of depreciation and cost of repair and replacement. Thus, one plant may be operated several years by making only necessary repairs and then be practically obsolete, having suffered maximum depreciation; another may be modernized every few years and remain at nearly the same value indefinitely, at a higher cost for repair and replacement.

In statements of cement companies representing 44 percent of the capacity in the United States (11), their bonded indebtedness was given as \$95,000,000, and the par value of their preferred stock was \$97,500,000. Assuming a 5-percent interest charge on bonds and 6 percent on preferred stock, the total interest charge amounts to \$10,600,000 annually, or 8.16 cents per barrel for an annual production of 130,000,000 barrels.

Exact rates of taxation imposed throughout the industry are not known. A property tax of 1 percent on 60 percent of the plant value and an income tax of 2 percent of the total sales value were assumed as reasonable figures.

Records of the Associated General Contractors of America, Inc. (6), indicate that insurance on plant and equipment is about equal to property taxes. In addition, compensation and liability insurance on employees amounts to about 2.5 percent of the wage item, or to 0.47 percent of the value of the product.

Laboratory, development, and advertising expenses are closely interrelated in the cement industry. A portion of the laboratory expense is for the control of manufacturing processes. The balance is for adver-

tising and for developing improved products in the individual plant or in cooperative laboratories. In answer to questionnaires of the United States Tariff Commission sent out in October 1930, 122 cement plants gave their selling expenses in addition to salesmen's salaries, expenses, and commission as less than 5 percent of the value of the product.⁶ Records of State highway departments on laboratory costs indicate that 18.8 percent goes to labor. Using the labor charge shown in table 7, the resulting charge for laboratory work becomes 4.74 percent, and the advertising and development charge is approximately 24 percent of the total for laboratory work.

| | Percentage of sale price |
|-------------------------------------|-----------------------------|
| Laboratory, exclusive of wages..... | 3.85 |
| Advertising and development..... | 1.14 |

As transportation is treated as an industry, it is necessary to segregate transportation costs in the cement industry. Practically all materials and products involved are transported by rail, so the cost is for rail transportation. Cost data were obtained from reports of the Interstate Commerce Commission (38). For example, the freight rate on explosives in 1931 was found to be \$17.30 per ton. Table 9 shows 0.148 pound of explosives to be required per barrel of cement, and at this rate the freight item amounts to: $\frac{17.30}{2,000} \times 0.148 = 0.13$ cents per barrel. Since costs for all materials used in the production of cement are costs at the cement mill, deduction of the freight item leaves the manufacturing cost of the materials. Thus, for explosives: $2.02 - 0.13 = 1.89$ cents, cost at source per barrel of cement.

As the subdivisions of the general items of expense attached to cement production have all been considered, the balance (7.7 percent) can be taken as the margin between the manufacturing cost and the selling price. The assembled items may be reclassified under four main heads: Salaries and wages, equipment, materials, and other expense. In this final form they constitute break-down no. 6, shown in table 5. In this table titles indicating general industries are applied. Thus cement rock or limestone and clay became "aggregates, quarrying", and gypsum was classed as "metallic-ore mining."

⁶ Prepared from unaudited statements received from such cement manufacturing companies (122 plants) as submitted to Price, Waterhouse & Co., replies to questionnaires of U. S. Tariff Commission dated October 1930.

ANALYSIS OF PAYMENTS TO OTHER INDUSTRIES

The average operating expense of each of the several industries was analyzed in a manner similar to that used for the cement industry; and the item costs are shown as percentages of the total cost, using similar subdivisions. Some of the industries, such as that analyzed in break-down no. 3 (plant and equipment expenditure for depreciation and repair and replacement) required special treatment. Examination of the financial reports of a large number of industrial establishments (11) indicated charges for land, buildings, and machinery, as follows:

| | Percent |
|----------------|---------|
| Land..... | 9 |
| Buildings..... | 23 |
| Machinery..... | 68 |
| | 100 |

Land charges are shown as interest and rentals and are included in the "margin" item of the "other expense" division. Building charges were obtained from a break-down of the census class of commercial building construction (23, 35), and machinery charges were obtained from a break-down of the expenses involved in the manufacture of industrial equipment. The industry shown as plant and equipment is thus a weighted composite of two industries and marginal items. All items of depreciation and repair and replacement were assigned to this industry (break-down no. 3).

The iron and steel industry (break-down no. 7) includes both the blast-furnace industry and the steel manufacturing industry, since many establishments are engaged in both operations.

Likewise, the coal and coke industry (break-down no. 9) includes the production and distribution of coal and the closely allied coke industry.

Forestry products industry (break-down no. 12) includes both the logging industry and the lumber-milling and pulpwood industry. The materials purchased by the latter industry are the products of the former. Combination of these activities simplified the procedure without appreciable effect upon the accuracy of the analysis.

In the petroleum refining industry the basic material is crude oil. Practically all crude oil moves directly to the refinery. In analyzing the petroleum-products industry (break-down no. 8) the production of crude oil and refining have been combined.

In the production of explosives, petroleum products, and iron and steel, chemicals are a minor expense. Chemicals are the products of both nonferrous-metals refining (industry break-down no. 20) and nonmetallic mining or quarrying (industry break-down no. 4). The materials of the nonferrous-metals refining industry are the products of metallic-ore mining (industry break-down no. 11). Some of the latter move directly into other industries, necessitating a separation of the mining and refining industries. The general industry groups are maintained to cover the assignment of these materials or products, none of which occur in amounts of sufficient value to justify the addition of a new industry.

Expenditures of the pipe industry (break-down no. 19) are composed of relatively small amounts for labor and equipment and large amounts for materials.

Expenditures of the advertising and development industry (break-down no. 13) are assumed to be represented by a distribution of expense in the printing and publishing industry rationalized to include some measure of exploratory work.

Laboratory expense consists of costs of a structure, frequently a portion of a factory, high-grade equipment, together with the expense of personnel and testing materials for experimental work. Thus a combination of the distribution for the plant and equipment industry, already made, and a distribution of the expense involved in the manufacture of precision instruments, suffice to provide the laboratory industry (break-down no. 15).

The items "Insurance" and "Taxes" are combined. They include insurance and taxes on equipment and buildings, contract bond premium, compensation and liability insurance, and income taxes. The collective treatment is justified since a large portion of the reserves of insurance companies are invested in bonds and other obligations of Federal, State, and municipal governments. The expense of insurance-company administration of premiums and other revenues is analogous to that of a nonprofit administrative enterprise, the expense of which is confined to salaries and wages, and plant and equipment.

In the distribution of governmental disbursements no specific information is available, but investigation disclosed general data which should serve the purpose

of this analysis. About 65 percent of the governmental revenue is expended for salaries and wages in the administration of various governmental services. It should be sufficiently accurate to assume that administrative salaries and wages together with the first increment of direct labor, expressed as a percentage of disbursements, closely approximates the direct labor percentage of the general construction expenditure, or 32 percent.

Table 11 shows the approximate disbursement of all governmental revenue on a weighted basis according to the relative revenue and disbursement of the Federal, State, and local administrative units (14, 16, 28). The data of this table are the basis for analysis of the insurance and taxes industry (break-down no. 5).

TABLE 11.—*Distribution of governmental disbursements*

| Disbursement item | Distribution to— | | | |
|---------------------------------|--------------------|---------------------|------------------|-----------------|
| | Salaries and wages | Plant and equipment | Interest | Total |
| General departments..... | Percent 37.2 | Percent 20.3 | Percent ----- | Percent 57.5 |
| Outlays, highway and other..... | 9.3 | 19.7 | ----- | 29.0 |
| Public service enterprise..... | .5 | ----- | 13.0 | .5 |
| Debt service..... | ----- | ----- | 13.0 | 13.0 |
| Total..... | 47.0 | 40.0 | 13.0 | 100.0 |

Fairly definite and reliable data substantiate the remaining break-downs for industries such as power, rubber, brick, and agricultural products, which constitute only a small percentage of the original expenditure. The procedure in each break-down was analogous to that already outlined and the sources of information are given in the appended bibliography.

In the later distribution of consumer expenditures, which are small income expended for the cost of living, the whole field of retail trade is assumed to receive such expenditures. The materials of retail trade are the products of wholesale trade. In turn, the materials of wholesale trade are basic materials of nature or are the products of manufacture and semimanufacture. The materials of manufacturing are, in turn, basic or products of semimanufacture, and the latter are absorbed into the manufacturing break-down.

The general data and some of the specific data necessary to break-down retail trade, wholesale trade, and manufacturing (24, 25) were obtained from reports resulting from the Fifteenth Census of the United States. These data were augmented by sources listed in the bibliography.

Retail trade (break-down no. 22), wholesale trade (break-down no. 23), and manufacturing (break-down no. 24) are the industries added to enable the distribution of consumer expenditures. They complete the list of industry break-downs needed to resume the analysis by means of the progressive distributions of highway expenditures to industries.

PROGRESSIVE DISTRIBUTION OF HIGHWAY-CONSTRUCTION EXPENDITURES

Break-downs for all the industries affected in substantial amounts have been made and further analysis involves distributing the items of the orig-

inal highway expenditure by means of these break-downs. Table 12 shows the method by which this is accomplished.

TABLE 12.—*Expenditure of \$100,000,000 for highways traced progressively through various industries until it ultimately reaches salaries and wages, interest, and margin*

BREAK-DOWN NO. 1—HIGHWAY CONSTRUCTION

[Figures in parentheses at heads of columns are percentages, from table 5, applied in making distributions]

| Progressive distribution no. | Distribution of expenditure for highway construction | | | | Distribution to— | | | | | | | | | | | | | | | |
|----------------------------------|--|---------------|--------------|--------------------|------------------|--------------|-----------------------------|----------------------------|-----------------------------|----------------------------|---------------------------|----------------------|---------------------------|-------------------------------------|--------------------|-------------------------------------|--------------------|---------------|--------------|---------|
| | Source | Amount | Total | Salaries and wages | Interest | Margin | No. 2, transportation | No. 3, plant and equipment | No. 4, aggregate, quarrying | No. 5, insurance and taxes | No. 6, iron and steel | No. 7, cement | No. 8, petroleum products | No. 9, forestry products | No. 10, power | No. 11, advertising and development | No. 12, laboratory | No. 13, brick | No. 14, pipe | |
| 1 | Original expenditure..... | \$100,000,000 | \$24,391,000 | \$1,385,400 | \$3,012,100 | \$17,544,100 | \$14,217,100 | \$11,220,300 | \$3,133,100 | \$14,332,600 | \$4,592,300 | \$4,811,700 | \$34,600 | \$87,900 | \$727,500 | | | | | |
| | Total..... | 100,000,000 | 28,788,500 | | | | | | | | | | | | | | | | | |
| BREAK-DOWN NO. 2.—TRANSPORTATION | | | | | | | | | | | | | | | | | | | | |
| Progressive distribution no. | Expenditure for transportation by other industries | | | | Distribution to— | | | | | | | | | | | | | | | |
| | Source | Amount | Total | Salaries and wages | Interest | Margin | No. 4, aggregate, quarrying | No. 5, insurance and taxes | No. 6, cement | No. 7, iron and steel | No. 8, petroleum products | No. 9, coal and coke | No. 10, power | No. 11, advertising and development | No. 12, laboratory | No. 13, brick | No. 14, pipe | | | |
| 2 | Highway construction..... | \$17,544,100 | \$17,544,100 | \$9,080,800 | \$729,800 | (4.16) | (14.37) | (0.37) | (9.14) | (0.18) | (10.58) | (0.42) | (3.12) | (0.39) | (1.65) | (2.17) | (1.09) | (0.22) | (0.38) | |
| | Aggregate, quarrying..... | 460,000 | 619,700 | 321,000 | 2,521,100 | \$64,900 | \$1,603,500 | \$31,600 | \$1,856,200 | \$73,700 | \$347,400 | \$68,400 | \$289,500 | \$380,700 | \$191,200 | \$38,600 | \$66,700 | | | |
| | Cement..... | 925,800 | 925,800 | 45,400 | 4,667,300 | 2,415,800 | 194,200 | 670,700 | 17,300 | 426,600 | 8,400 | 493,800 | 19,600 | 145,500 | 18,200 | 77,000 | 101,300 | 50,900 | 10,200 | 17,700 |
| 3 | Pipe..... | 65,200 | 65,200 | 38,100 | 2,213,100 | 1,145,500 | 92,000 | 292,800 | 8,200 | 202,300 | 4,000 | 234,200 | 9,300 | 69,100 | 8,600 | 36,500 | 48,000 | 24,100 | 4,900 | 8,400 |
| 4 | Brick..... | 45,400 | 514,700 | 25,600 | 225,500 | 10,000 | 1,145,500 | 92,000 | 318,000 | 8,200 | 202,300 | 4,000 | 234,200 | 9,300 | 69,100 | 8,600 | 36,500 | 48,000 | 24,100 | 4,900 |
| | Insurance and taxes..... | 244,400 | 514,700 | 25,600 | 225,500 | 10,000 | 1,145,500 | 92,000 | 318,000 | 8,200 | 202,300 | 4,000 | 234,200 | 9,300 | 69,100 | 8,600 | 36,500 | 48,000 | 24,100 | 4,900 |
| | Plant and equipment..... | 514,700 | 514,700 | 25,600 | 225,500 | 10,000 | 1,145,500 | 92,000 | 318,000 | 8,200 | 202,300 | 4,000 | 234,200 | 9,300 | 69,100 | 8,600 | 36,500 | 48,000 | 24,100 | 4,900 |
| | Petroleum products..... | 58,100 | 770,600 | 61,500 | 61,500 | 18,400 | 54,900 | 72,000 | 10,000 | 292,800 | 58,000 | 45,700 | 31,200 | 248,800 | 170,700 | 18,500 | 51,400 | 16,100 | 11,600 | 305,600 |
| | Aggregate, quarrying..... | 38,100 | 770,600 | 61,500 | 61,500 | 18,400 | 54,900 | 72,000 | 10,000 | 292,800 | 58,000 | 45,700 | 31,200 | 248,800 | 170,700 | 18,500 | 51,400 | 16,100 | 11,600 | 305,600 |
| | Brick..... | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 |
| | Nonferrous-metals refining..... | 225,500 | 225,500 | 225,500 | 225,500 | 225,500 | 225,500 | 225,500 | 225,500 | 225,500 | 225,500 | 225,500 | 225,500 | 225,500 | 225,500 | 225,500 | 225,500 | 225,500 | 225,500 | 225,500 |
| | Metallic-ore mining..... | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 |
| | Container..... | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 |
| | Explosives..... | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 |
| | Insurance and taxes..... | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 |
| | Advertising and development..... | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 |
| | Rubber..... | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 |
| | Plant and equipment..... | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 |
| | Petroleum products..... | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 |
| | Coal and coke..... | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 |
| | Power..... | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 |
| 5 | Aggregate, quarrying..... | 87,200 | 481,100 | 38,700 | 929,600 | 43,000 | 43,000 | 115,500 | 115,500 | 115,500 | 115,500 | 115,500 | 115,500 | 115,500 | 115,500 | 115,500 | 115,500 | 115,500 | 115,500 | 115,500 |
| | Brick..... | 2,600 | 2,600 | 3,400 | 3,400 | 3,400 | 3,400 | 8,300 | 8,300 | 8,300 | 8,300 | 8,300 | 8,300 | 8,300 | 8,300 | 8,300 | 8,300 | 8,300 | 8,300 | 8,300 |
| | Nonferrous-metals refining..... | 42,000 | 42,000 | 85,000 | 85,000 | 85,000 | 85,000 | 1,700 | 1,700 | 1,700 | 1,700 | 1,700 | 1,700 | 1,700 | 1,700 | 1,700 | 1,700 | 1,700 | 1,700 | 1,700 |
| | Container..... | 16,100 | 16,100 | 11,600 | 11,600 | 11,600 | 11,600 | 305,600 | 305,600 | 305,600 | 305,600 | 305,600 | 305,600 | 305,600 | 305,600 | 305,600 | 305,600 | 305,600 | 305,600 | 305,600 |
| | Explosives..... | 11,100 | 11,100 | 11,100 | 11,100 | 11,100 | 11,100 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 |
| | Insurance and taxes..... | 16,800 | 16,800 | 16,800 | 16,800 | 16,800 | 16,800 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 |
| | Laboratory..... | 11,500 | 11,500 | 11,500 | 11,500 | 11,500 | 11,500 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 |
| | Advertising and development..... | 16,800 | 16,800 | 16,800 | 16,800 | 16,800 | 16,800 | 20,200 | 20,200 | 20,200 | 20,200 | 20,200 | 20,200 | 20,200 | 20,200 | 20,200 | 20,200 | 20,200 | 20,200 | 20,200 |
| | Rubber..... | 11,100 | 11,100 | 11,100 | 11,100 | 11,100 | 11,100 | 13,600 | 13,600 | 13,600 | 13,600 | 13,600 | 13,600 | 13,600 | 13,600 | 13,600 | 13,600 | 13,600 | 13,600 | 13,600 |
| | Agricultural products..... | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 | 135,800 |
| | Plant and equipment..... | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 | 49,300 |
| | Petroleum products..... | 6,600 | 6,600 | 6,600 | 6,600 | 6,600 | 6,600 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 |
| | Coal and coke..... | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 | 14,000 |

ANALYSIS OF HIGHWAY-CONSTRUCTION EXPENDITURES

TABLE 12.—Expenditure of \$100,000,000 for highways traced progressively through various industries until it ultimately reaches salaries and wages, interest, and margin—Contd.

BREAK-DOWN NO. 2—TRANSPORTATION—Continued

[Figures in parentheses at heads of columns are percentages, from table 5, applied in making distributions]

| Progressive distribution no. | Expenditures for transportation by other industries | | | | Distribution to— | | | |
|------------------------------|---|---------|------------|--------------------|------------------|------------|-----------------------------|----------------------------|
| | Source | Amount | Total | Salaries and wages | Interest | Margin | No. 4, aggregate, quarrying | No. 5, insurance and taxes |
| Aggregate, quarrying | | (51.76) | (4.16) | (51.76) | (9.14) | (0.37) | (0.18) | (0.58) |
| Cement | | 5,100 | | | | | | |
| Iron and steel | | 6,300 | | | | | | |
| Forestry products | | 147,500 | | | | | | |
| Brick | | 16,800 | | | | | | |
| Nonferrous-metals refining | | 4,600 | | | | | | |
| Metallic-ore mining | | 16,900 | | | | | | |
| Container | | 44,700 | | | | | | |
| Explosives | | 600 | | | | | | |
| Insurance and taxes | | 25,200 | \$436,500 | \$18,200 | \$62,700 | \$1,600 | \$39,900 | \$800 |
| Laboratory | | 51,400 | | | | | | |
| Advertising and development | | 5,100 | | | | | | |
| Rubber | | 7,800 | | | | | | |
| Agricultural products | | 8,300 | | | | | | |
| Plant and equipment | | 5,200 | | | | | | |
| Petroleum products | | 156,200 | | | | | | |
| Coal and coke | | 24,700 | | | | | | |
| Power | | 2,800 | | | | | | |
| Accruals from distribution 6 | | 7,300 | { 190,600 | 271,200 | 140,400 | 11,300 | 38,900 | |
| Total | | 180,600 | | | | | | |
| | | | 13,489,600 | 1,084,200 | 3,745,000 | 18,318,800 | | |
| | | | 26,061,800 | | | | | |

BREAK-DOWN NO. 3—PLANT AND EQUIPMENT

| Progressive distribution no. | Expenditure for plant and equipment by other industries | | | | Distribution to— | | | |
|------------------------------|---|--------------|--------------|--------------------|------------------|-------------|-----------------------------|----------------------------|
| | Source | Amount | Total | Salaries and wages | Interest | Margin | No. 4, aggregate, quarrying | No. 5, insurance and taxes |
| Highway construction | | (40.31) | (4.73) | (40.31) | (0.80) | (16.44) | (0.62) | (0.80) |
| Petroleum products | | \$14,217,100 | \$14,217,100 | \$5,730,900 | \$672,500 | \$2,337,300 | \$514,700 | \$113,700 |
| Aggregate, quarrying | | 1,065,500 | | | | | | |
| Cement | | 1,968,000 | | | | | | |
| Pipe | | 2,250,200 | | | | | | |
| Brick | | 460,500 | 6,873,200 | 2,770,600 | 325,100 | 1,130,000 | 248,800 | 55,000 |
| Insurance and taxes | | 53,500 | | | | | | |
| | | 57,000 | | | | | | |
| | | 9,700 | | | | | | |
| | | 1,008,800 | | | | | | |

| | |
|---------------------------------------|------------------------------------|
| No. 20, nonferrous-metals refining | No. 17, brick |
| No. 15, advertising and development | No. 16, rubber |
| No. 8, petroleum products | No. 9, coal and coke |
| No. 7, iron and steel | No. 6, cement |
| No. 5, insurance and taxes | No. 4, aggregate, quarrying |
| No. 4, aggregate, quarrying | No. 5, insurance and taxes |
| No. 3, advertising and development | No. 4, aggregate, quarrying |
| No. 2, transportation | No. 3, advertising and development |
| No. 1, insurance and taxes | No. 2, transportation |
| No. 0, 20, nonferrous-metals refining | No. 1, insurance and taxes |

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¹ Calculated value of business transacted in subsequent distributions. Details of derivation not shown.

ANALYSIS OF HIGHWAY-CONSTRUCTION EXPENDITURES

TABLE 12.—Expenditure of \$100,000,000 for highways traced progressively through various industries until it ultimately reaches salaries and wages, interest, and margin—Contd.

BREAK-DOWN NO. 4-AGGREGATE, QUARRYING

[Figures in parentheses at heads of columns are percentages, from table 5, applied in making distributions]

1. Colonized value of business transacted in subsequent distributions. Details of derivation not shown.

PROGRESSIVE DISTRIBUTION OF HIGHWAY-CONSTRUCTION EXPENDITURES

BREAK-DOWN NO. 5—INSURANCE AND TAXES

| Pro- gressive distri- bution no. | Expenditure for insurance and taxes by other industries | | | | | Expenditure for insurance and taxes by other industries | | | | | |
|--|---|-------------|-----------------------|----------|------------------------------------|---|-----------------------------|-----------|-----------------------|----------|------------------------------------|
| | Source | Amount | Salaries and wages | Interest | No. 2, trans- porta- tion | No. 3, plant and equip- ment | Source | Amount | Salaries and wages | Interest | No. 2, trans- porta- tion |
| | | | | | | | | | | | |
| 2 | Highway construction | \$3,133,100 | \$3,133,100 | (47,000) | (7,800) | (32,200) | Transportation | \$202,300 | (47,000) | (13,000) | (7,800) |
| | Plant and equipment | 1,472,600 | 1,472,600 | (13,000) | \$407,300 | \$244,400 | Aggregate, quarrying | 15,700 | | | |
| | Petroleum products | 232,800 | 232,800 | | | | Cement | 4,900 | | | |
| | Transportation | 1,603,500 | 1,603,500 | | | | Agricultural products | 31,100 | | | |
| | Aggregate, quarrying | 451,100 | 451,100 | | | | Iron and steel | 22,500 | | | |
| | Cement | 695,100 | 695,100 | | | | Forestry products | \$659,500 | | | |
| | Iron and steel | 118,400 | 118,400 | | | | Brick | 5,600 | | | |
| | Pipe | 25,500 | 25,500 | | | | Nonferrous-metals refining | 3,700 | | | |
| | Forestry products | 28,700 | 28,700 | | | | Metallic-ore mining | 28,800 | | | |
| | Brick | 4,400 | 4,400 | | | | Container | 1,800 | | | |
| | Laboratory | 40,300 | 40,300 | | | | Explosives | 19,300 | | | |
| | Rubber | 51,600 | 51,600 | | | | Laboratory | 3,500 | | | |
| | Advertising and development | 15,700 | 15,700 | | | | Advertising and development | 8,800 | | | |
| | Plant and equipment | 287,300 | 287,300 | | | | Rubber | 4,200 | | | |
| | Petroleum products | 52,600 | 52,600 | | | | Agricultural products | 14,700 | | | |
| | Coal and coke | 53,300 | 53,300 | | | | Plant and equipment | 65,000 | | | |
| | Power | 168,600 | 168,600 | | | | Petroleum products | 7,600 | | | |
| | Transportation | 428,600 | 428,600 | | | | Coal and coke | 12,500 | | | |
| 3 | Aggregate, quarrying | 57,000 | 57,000 | | | | Power | 23,900 | | | |
| | Cement | 10,800 | 10,800 | | | | Transportation | \$85,000 | | | |
| | Iron and steel | 98,500 | 98,500 | | | | Aggregate, quarrying | 137,800 | | | |
| | Forestry products | 39,000 | 39,000 | | | | Cement | 4,900 | | | |
| | Brick | 12,300 | 12,300 | | | | Iron and steel | 2,700 | | | |
| | Nonferrous-metals refining | 4,900 | 4,900 | | | | Forestry products | 18,900 | | | |
| | Metallic-ore mining | 23,700 | 23,700 | | | | Brick | 10,600 | | | |
| | Container | 7,100 | 7,100 | | | | Nonferrous-metals refining | 3,100 | | | |
| | Explosives | 101,200 | 101,200 | | | | Metallic-ore mining | 1,500 | | | |
| | Laboratory | 8,000 | 8,000 | | | | Container | 14,000 | | | |
| | Advertising and development | 19,000 | 19,000 | | | | Explosives | 400 | | | |
| | Rubber | 7,000 | 7,000 | | | | Explosives | 11,300 | | | |
| 4 | Plant and equipment | 159,500 | 159,500 | | | | Aggregate, quarrying | 135,300 | | | |
| | Petroleum products | 29,800 | 29,800 | | | | Cement | 1,90,200 | | | |
| | Coal and coke | 46,000 | 46,000 | | | | Iron and steel | 225,500 | | | |
| | Power | | | | | | Forestry products | 225,500 | | | |
| 5 | Total | | | | | | Brick | | | | |
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| | | | | | | | Iron and steel | | | | |
| | | | | | | | Forestry products | | | | |
| | | | | | | | Brick | | | | |
| | | | | | | | Nonferrous-metals refining | | | | |
| | | | | | | | Metallic-ore mining | | | | |
| | | | | | | | Container | | | | |
| | | | | | | | Explosives | | | | |
| | | | | | | | Aggregate, quarrying | | | | |
| | | | | | | | Cement | | | | |
| | | | | | | | Iron and steel | | | | |
| | | </td | | | | | | | | | |

BREAK-DOWN NO. 6—CEMENT

1. Consolidated results of businesses transacted in subsequent distributions. Details of derivation not shown.

ANALYSIS OF HIGHWAY-CONSTRUCTION EXPENDITURES

TABLE 12.—Expenditure of \$100,000,000 for highways traced progressively through various industries until it ultimately reaches salaries and wages, interest, and margin—Contd.

BREAK-DOWN NO. 7-IRON AND STEEL

Figures in parentheses at heads of columns are percentages, from table 5, applied in making distributions.

¹ Calculated value of business transacted in subsequent distributions. Details of derivation not shown.

BREAK-DOWN NO. 8—PETROLEUM PRODUCTS

PROGRESSIVE DISTRIBUTION OF HIGHWAY-CONSTRUCTION EXPENDITURES

23

| Progressive distribution no. | Source | Amount | Total | Distribution to— | | | | | | | | No. 21, container | |
|------------------------------|---|-------------|-------------|--------------------|-----------|-----------|-----------------------|----------------------------|-----------------------------|----------------------------|----------------------|-------------------|----------|
| | | | | Salaries and wages | Interest | Margin | No. 2, transportation | No. 3, plant and equipment | No. 4, aggregate, quarrying | No. 5, insurance and taxes | No. 9, coal and coke | No. 10, power | |
| 2 | Highway construction (Plant and equipment) | \$4,592,600 | \$4,592,600 | (29,80) | (5,48) | (13,06) | (16,45) | (23,20) | (0,77) | (5,07) | (0,13) | (1,78) | (2,10) |
| | Transportation | 92,400 | | \$1,368,600 | \$251,700 | \$599,800 | \$755,500 | \$1,065,500 | \$35,400 | \$232,800 | \$6,000 | \$12,900 | \$86,400 |
| 3 | Aggregate, quarrying | 73,700 | | | | | | | | | | | |
| | Cement | 311,900 | | | | | | | | | | | |
| | Iron and steel | 493,000 | | | | | | | | | | | |
| | Pipe | 50,500 | | | | | | | | | | | |
| | Forestry products | 5,200 | | | | | | | | | | | |
| | Brick | 7,400 | | | | | | | | | | | |
| | Coal and coke | 3,800 | | | | | | | | | | | |
| | Power | 18,300 | | | | | | | | | | | |
| | Transportation | 35,300 | | | | | | | | | | | |
| | Aggregate, quarrying | 19,600 | | | | | | | | | | | |
| | Cement | 39,400 | | | | | | | | | | | |
| | Iron and steel | 7,600 | | | | | | | | | | | |
| | Forestry products | 42,000 | | | | | | | | | | | |
| 4 | Nonferrous-metals refining | 10,000 | | | | | | | | | | | |
| | Metals-ore mining | 5,600 | | | | | | | | | | | |
| | Container | 25,900 | | | | | | | | | | | |
| | Explosives | 400 | | | | | | | | | | | |
| | Laboratory | 18,900 | | | | | | | | | | | |
| | Advertising and development | 3,600 | | | | | | | | | | | |
| | Rubber | 17,300 | | | | | | | | | | | |
| | Plant and equipment | 4,400 | | | | | | | | | | | |
| | Coal and coke | 44,700 | | | | | | | | | | | |
| | Power | 6,600 | | | | | | | | | | | |
| | Transportation | 9,600 | | | | | | | | | | | |
| | Aggregate, quarrying | 9,300 | | | | | | | | | | | |
| | Cement | 10,900 | | | | | | | | | | | |
| | Iron and steel | 3,500 | | | | | | | | | | | |
| | Forestry products | 16,700 | | | | | | | | | | | |
| | Brick | 5,800 | | | | | | | | | | | |
| 5 | Nonferrous-metals refining | 4,700 | | | | | | | | | | | |
| | Metallic-ore mining | 4,300 | | | | | | | | | | | |
| | Container | 31,300 | | | | | | | | | | | |
| | Explosives | 3,100 | | | | | | | | | | | |
| | Laboratory | 3,600 | | | | | | | | | | | |
| | Advertising and development | 700 | | | | | | | | | | | |
| | Agricultural products | 6,400 | | | | | | | | | | | |
| | Plant and equipment | 12,000 | | | | | | | | | | | |
| | Rubber | 24,700 | | | | | | | | | | | |
| | Coal and coke | 2,800 | | | | | | | | | | | |
| | Power | 5,000 | | | | | | | | | | | |
| | Transportation | 3,900 | | | | | | | | | | | |
| | Aggregate, quarrying | 3,400 | | | | | | | | | | | |
| | Cement | 1,900 | | | | | | | | | | | |
| | Iron and steel | 8,000 | | | | | | | | | | | |
| | Forestry products | 2,800 | | | | | | | | | | | |
| | Brick | 2,600 | | | | | | | | | | | |
| | Metallic-ore mining | 1,800 | | | | | | | | | | | |
| | Explosives | 2,100 | | | | | | | | | | | |
| | Laboratory | 300 | | | | | | | | | | | |
| | Advertising and development | 2,900 | | | | | | | | | | | |
| | Rubber | 1,100 | | | | | | | | | | | |
| | Agricultural products | 5,600 | | | | | | | | | | | |
| | Plant and equipment | 10,100 | | | | | | | | | | | |
| 7 | Accruals from distribution 6 | 31,600 | | | | | | | | | | | |
| | | 133,600 | | | | | | | | | | | |
| | Total | 6,215,000 | | | | | | | | | | | |
| | | 1,852,200 | | | | | | | | | | | |
| | | 340,500 | | | | | | | | | | | |
| | | 3,004,500 | | | | | | | | | | | |
| | | 3,004,500 | | | | | | | | | | | |

1 Calculated value of business transacted in subsequent distributions. Details of derivation not shown.

ANALYSIS OF HIGHWAY-CONSTRUCTION EXPENDITURES

TABLE 12.—*Expenditure of \$100,000,000 for highways traced progressively through various industries until it ultimately reaches salaries and wages, interest, and margin—Contd.*

BREAK-DOWN NO. 9—COAL AND COKE

[Figures in parentheses at heads of columns are percentages, from table 5, applied in making distributions]

BREAK-DOWN NO. 10—POWER

PROGRESSIVE DISTRIBUTION OF HIGHWAY-CONSTRUCTION EXPENDITURES

25

| Progressive distribution no. | Source | Expenditure for power by other industries | | | | | Distribution to— | | | | | | |
|------------------------------|--|--|---|---------------------|---------------------|--------------------|-----------------------|----------------------------|----------------------------|---------------------------|----------------------|----------------------|-----------|
| | | Amount | Total | Salaries and wages | Interest | Margin | No. 2, transportation | No. 3, plant and equipment | No. 5, insurance and taxes | No. 8, petroleum products | No. 9, coal and coke | | |
| 1590—35—4 | Transportation— Aggregate, quarrying— Cement— Iron and steel— Pipe— Forestry products— Brick— Plant and equipment— Petroleum products— Transportation— Aggregate, quarrying— Cement— Iron and steel— Forestry products— Brick— Nonferrous-metals refining— Metallic-ore mining— Container— Explosives— Laboratory— Advertising and development— Rubber— Plant and equipment— Petroleum products— Coal and coke— Transportation— Aggregate, quarrying— Cement— Iron and steel— Forestry products— Brick— Nonferrous-metals refining— Metallic-ore mining— Container— Explosives— Laboratory— Advertising and development— Rubber— Agricultural products— Plant and equipment— Petroleum products— Coal and coke— Transportation— Aggregate, quarrying— Cement— Iron and steel— Forestry products— Brick— Nonferrous-metals refining— Metallic-ore mining— Container— Explosives— Laboratory— Advertising and development— Rubber— Agricultural products— Plant and equipment— Petroleum products— Coal and coke— Accruals from distribution 6— Total— | \$68,400 539,700 829,900 40,900 9,400 23,900 3,400 91,000 12,900 18,200 68,200 12,900 34,000 32,400 9,400 4,100 56,600 1,800 22,500 5,800 76,700 5,200 44,000 4,200 47,100 8,600 18,800 5,800 13,500 18,700 4,300 4,300 1,200 28,200 1,2,500 9,800 24,400 800 16,800 3,600 5,900 3,300 6,500 8,800 2,300 1,300 35,200 100 2,500 500 13,100 4,600 9,900 400 7,100 47,900 1,25,200 | (21.65) \$1,619,500 \$350,600 \$257,200 \$452,700 \$51,400 \$212,800 \$168,600 \$35,300 \$38,900 \$42,000 | (15.88) (\$2.59) | (27.95) (\$2.59) | (3.18) (\$2.59) | (13.14) (\$2.59) | (10.41) (\$2.59) | (2.18) (\$2.59) | (3.02) (\$2.59) | (2.18) (\$2.59) | (11.100) (\$2.59) | 1,618,000 |

Calculated value of business transacted in subsequent distributions. Details of derivation not shown.

ANALYSIS OF HIGHWAY-CONSTRUCTION EXPENDITURES

TABLE 12.—*Expenditure of \$100,000,000 for highways traced progressively through various industries until it ultimately reaches salaries and wages, interest, and margin—Contd.*

BREAK-DOWN NO. 11-METALLIC-ORE MINING

[Figures in parentheses at heads of columns are percentages, from table 5; applied in making distributions]

BREAK-DOWN NO. 12—FORESTRY PRODUCTS

BREAK-DOWN NO. 13—ADVERTISING AND DEVELOPMENT

PROGRESSIVE DISTRIBUTION OF HIGHWAY-CONSTRUCTION EXPENDITURES

27

| Progressive distribution no. | Expenditure for advertising and development by other industries | Distribution to— | | | | | | | | | | | | |
|------------------------------|---|-----------------------|-------------|--------------------------|--------------------|-----------|----------|-----------------------|----------------------------|----------------------------|---------------------------|----------------------|---------------|---------------------------|
| | | Source | Amount | Total | Salaries and wages | Interest | Margin | No. 2, transportation | No. 3, plant and equipment | No. 5, insurance and taxes | No. 8, petroleum products | No. 9, coal and coke | No. 10, power | No. 12, forestry products |
| 3 | Plant and equipment..... | \$270,100 | (37.48) | (5,85) | (7.98) | | | (3.46) | (26.10) | (3.91) | | (1.31) | (5.81) | (7.48) |
| | Petroleum products..... | 86,300 | | | | | | | | | | | | |
| | Transportation..... | 380,700 | | | | | | | | | | | | |
| | Aggregate, quarrying..... | 318,700 | | | | | | | | | | | | |
| | Cement..... | 163,400 | \$1,319,900 | \$494,700 | \$77,200 | \$105,300 | \$45,700 | \$344,500 | \$51,600 | \$17,300 | \$8,200 | \$76,700 | \$98,700 | |
| 4 | Iron and steel..... | 52,000 | | | | | | | | | | | | |
| | Pipe..... | 36,300 | | | | | | | | | | | | |
| | Forestry products..... | 9,800 | | | | | | | | | | | | |
| | Brick..... | 2,600 | | | | | | | | | | | | |
| | Rubber..... | 8,800 | | | | | | | | | | | | |
| | Plant and equipment..... | 130,600 | | | | | | | | | | | | |
| | Petroleum products..... | 19,300 | | | | | | | | | | | | |
| | Coal and coke..... | 10,800 | | | | | | | | | | | | |
| | Power..... | 42,000 | | | | | | | | | | | | |
| | Transportation..... | 101,300 | | | | | | | | | | | | |
| | Aggregate, quarrying..... | 40,300 | | | | | | | | | | | | |
| | Cement..... | 2,500 | | | | | | | | | | | | |
| | Iron and steel..... | 43,200 | | | | | | | | | | | | |
| | Forestry products..... | 13,300 | | | | | | | | | | | | |
| | Brick..... | 7,400 | | | | | | | | | | | | |
| | Nonferrous-metals refining..... | 4,000 | | | | | | | | | | | | |
| | Metallic-ore mining..... | 23,400 | | | | | | | | | | | | |
| | Container..... | 1,000 | | | | | | | | | | | | |
| | Explosives..... | 19,700 | | | | | | | | | | | | |
| | Laboratory..... | 17,600 | | | | | | | | | | | | |
| | Rubber..... | 4,300 | | | | | | | | | | | | |
| | Plant and equipment..... | 72,300 | | | | | | | | | | | | |
| | Petroleum products..... | 5,600 | | | | | | | | | | | | |
| | Coal and coke..... | 3,900 | | | | | | | | | | | | |
| | Power..... | 11,500 | | | | | | | | | | | | |
| | Transportation..... | 48,000 | | | | | | | | | | | | |
| | Aggregate, quarrying..... | 11,200 | | | | | | | | | | | | |
| | Cement..... | 1,200 | | | | | | | | | | | | |
| | Iron and steel..... | 17,100 | | | | | | | | | | | | |
| | Forestry products..... | 7,700 | | | | | | | | | | | | |
| | Brick..... | 3,300 | | | | | | | | | | | | |
| | Nonferrous-metals refining..... | 3,100 | | | | | | | | | | | | |
| | Metallic-ore mining..... | 28,300 | | | | | | | | | | | | |
| | Container..... | 3,800 | | | | | | | | | | | | |
| | Explosives..... | 3,500 | | | | | | | | | | | | |
| | Laboratory..... | 2,400 | | | | | | | | | | | | |
| | Rubber..... | 29,500 | | | | | | | | | | | | |
| | Plant and equipment..... | 2,800 | | | | | | | | | | | | |
| | Petroleum products..... | 1,600 | | | | | | | | | | | | |
| | Coal and coke..... | 6,000 | | | | | | | | | | | | |
| | Power..... | 20,200 | | | | | | | | | | | | |
| | Transportation..... | 3,500 | | | | | | | | | | | | |
| | Aggregate, quarrying..... | 600 | | | | | | | | | | | | |
| | Cement..... | 8,300 | | | | | | | | | | | | |
| | Iron and steel..... | 3,600 | | | | | | | | | | | | |
| | Forestry products..... | 3,600 | | | | | | | | | | | | |
| | Brick..... | 1,800 | | | | | | | | | | | | |
| | Nonferrous-metals refining..... | 1,200 | | | | | | | | | | | | |
| | Metallic-ore mining..... | 14,600 | | | | | | | | | | | | |
| | Container..... | 100 | | | | | | | | | | | | |
| | Explosives..... | 2,200 | | | | | | | | | | | | |
| | Laboratory..... | 1,500 | | | | | | | | | | | | |
| | Accruals from distribution 6..... | { 45,400 143,000 } | 88,400 | 33,100 | 5,200 | | | | | | | | | |
| 7 | Total..... | ----- | 2,218,500 | { 831,400 1,158,200 } | 1,129,800 | 177,000 | | | | | | | | |

¹ Calculated value of business transacted in subsequent distributions. Details of derivation not shown.

ANALYSIS OF HIGHWAY-CONSTRUCTION EXPENDITURES

TABLE 12.—*Expenditure of \$100,000,000 for highways traced progressively through various industries until it ultimately reaches salaries and wages, interest, and margin—Contd.*

BREAK-DOWN NO. 14—EXPLOSIVES

[Figures in parentheses at heads of columns are percentages, from table 5, applied in making distributions]

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| | | | | | | | | |
|----------------------------|-----------|--|--|--|--|--|--|--|
| Rubber | 5,200 | | | | | | | |
| Plant and equipment | 35,400 | | | | | | | |
| Petroleum products | 5,300 | | | | | | | |
| Transportation | 24,100 | | | | | | | |
| Aggregate, quarrying | 4,200 | | | | | | | |
| Cement | 3,900 | | | | | | | |
| Iron and steel | 15,900 | | | | | | | |
| Brick | 1,400 | | | | | | | |
| Nonferrous-metals refining | 1,100 | | | | | | | |
| Explosives | 2,300 | | | | | | | |
| Rubber | 2,900 | | | | | | | |
| Plant and equipment | 14,500 | | | | | | | |
| Petroleum products | 2,700 | | | | | | | |
| Transportation | 10,100 | | | | | | | |
| Aggregate, quarrying | 1,300 | | | | | | | |
| Cement | 2,100 | | | | | | | |
| Iron and steel | 7,700 | | | | | | | |
| Brick | 800 | | | | | | | |
| Nonferrous-metals refining | 400 | | | | | | | |
| Explosives | 1,300 | | | | | | | |
| Accruals from distribution | 6 | | | | | | | |
| Total | 1,531,900 | | | | | | | |
| | | | | | | | | |
| | 567,200 | | | | | | | |
| | 807,700 | | | | | | | |
| | | | | | | | | |
| | 1,531,900 | | | | | | | |
| | | | | | | | | |
| | 1,500 | | | | | | | |
| | 500 | | | | | | | |
| | 200 | | | | | | | |
| | 300 | | | | | | | |
| | 13,700 | | | | | | | |
| | 3,500 | | | | | | | |
| | 11,200 | | | | | | | |
| | 4,500 | | | | | | | |
| | 36,600 | | | | | | | |
| | 98,800 | | | | | | | |
| | 5,100 | | | | | | | |
| | 11,000 | | | | | | | |
| | 4,500 | | | | | | | |
| | 3,500 | | | | | | | |
| | 1,500 | | | | | | | |
| | 500 | | | | | | | |
| | 200 | | | | | | | |
| | 300 | | | | | | | |
| | 13,700 | | | | | | | |
| | 3,500 | | | | | | | |
| | 11,200 | | | | | | | |
| | 4,500 | | | | | | | |
| | 36,600 | | | | | | | |
| | 98,800 | | | | | | | |
| | 5,100 | | | | | | | |
| | 11,000 | | | | | | | |
| | 4,500 | | | | | | | |
| | 3,500 | | | | | | | |
| | 1,500 | | | | | | | |
| | 500 | | | | | | | |
| | 200 | | | | | | | |
| | 300 | | | | | | | |
| | 13,700 | | | | | | | |
| | 3,500 | | | | | | | |
| | 11,200 | | | | | | | |
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| | 36,600 | | | | | | | |
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| | 200 | | | | | | | |
| | 300 | | | | | | | |
| | 13,700 | | | | | | | |
| | 3,500 | | | | | | | |
| | 11,200 | | | | | | | |
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| | 36,600 | | | | | | | |
| | 98,800 | | | | | | | |
| | 5,100 | | | | | | | |
| | 11,000 | | | | | | | |
| | 4,500 | | | | | | | |
| | 3,500 | | | | | | | |
| | 1,500 | | | | | | | |
| | 500 | | | | | | | |
| | 200 | | | | | | | |
| | 300 | | | | | | | |
| | 13,700 | | | | | | | |
| | 3,500 | | | | | | | |
| | 11,200 | | | | | | | |
| | 4,500 | | | | | | | |
| | 36,600 | | | | | | | |
| | 98,800 | | | | | | | |
| | 5,100 | | | | | | | |
| | 11,000 | | | | | | | |
| | 4,500 | | | | | | | |
| | 3,500 | | | | | | | |
| | 1,500 | | | | | | | |
| | 500 | | | | | | | |
| | 200 | | | | | | | |
| | 300 | | | | | | | |
| | 13,700 | | | | | | | |
| | 3,500 | | | | | | | |
| | 11,200 | | | | | | | |
| | 4,500 | | | | | | | |
| | 36,600 | | | | | | | |
| | 98,800 | | | | | | | |
| | 5,100 | | | | | | | |
| | 11,000 | | | | | | | |
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| | 1,500 | | | | | | | |
| | 500 | | | | | | | |
| | 200 | | | | | | | |
| | 300 | | | | | | | |
| | 13,700 | | | | | | | |
| | 3,500 | | | | | | | |
| | 11,200 | | | | | | | |
| | 4,500 | | | | | | | |
| | 36,600 | | | | | | | |
| | 98,800 | | | | | | | |
| | 5,100 | | | | | | | |
| | 11,000 | | | | | | | |
| | 4,500 | | | | | | | |
| | 3,500 | | | | | | | |
| | 1,500 | | | | | | | |
| | 500 | | | | | | | |
| | 200 | | | | | | | |
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| | 13,700 | | | | | | | |
| | 3,500 | | | | | | | |
| | 11,200 | | | | | | | |
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| | 98,800 | | | | | | | |
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| | 13,700 | | | | | | | |
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| | 98,800 | | | | | | | |
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| | 3,500 | | | | | | | |
| | 1,500 | | | | | | | |
| | 500 | | | | | | | |
| | 200 | | | | | | | |
| | 300 | | | | | | | |
| | 13,700 | | | | | | | |
| | 3,500 | | | | | | | |
| | 11,200 | | | | | | | |
| | 4,500 | | | | | | | |
| | 36,600 | | | | | | | |
| | 98,800 | | | | | | | |
| | 5,100 | | | | | | | |
| | 11,000 | | | | | | | |
| | 4,500 | | | | | | | |
| | 3,500 | | | | | | | |
| | 1,500 | | | | | | | |
| | 500 | | | | | | | |
| | 200 | | | | | | | |
| | 300 | | | | | | | |
| | 13,700 | | | | | | | |
| | 3,500 | | | | | | | |
| | 11,200 | | | | | | | |
| | 4,500 | | | | | | | |
| | 36,600 | | | | | | | |
| | 98,800 | | | | | | | |
| | 5,100 | | | | | | | |
| | 11,000 | | | | | | | |
| | 4,500 | | | | | | | |
| | 3,500 | | | | | | | |
| | 1,500 | | | | | | | |
| | 500 | | | | | | | |
| | 200 | | | | | | | |
| | 300 | | | | | | | |
| | 13,700 | | | | | | | |
| | 3,500 | | | | | | | |
| | 11,200 | | | | | | | |
| | 4,500 | | | | | | | |
| | 36,600 | | | | | | | |
| | 98,800 | | | | | | | |
| | 5,100 | | | | | | | |
| | 11,000 | | | | | | | |
| | 4,500 | | | | | | | |
| | 3,500 | | | | | | | |
| | 1,500 | | | | | | | |
| | 500 | | | | | | | |
| | 200 | | | | | | | |
| | 300 | | | | | | | |
| | 13,700 | | | | | | | |
| | 3,500 | | | | | | | |
| | 11,200 | | | | | | | |
| | 4,500 | | | | | | | |
| | 36,600 | | | | | | | |
| | 98,800 | | | | | | | |
| | 5,100 | | | | | | | |
| | 11,000 | | | | | | | |
| | 4,500 | | | | | | | |
| | 3,500 | | | | | | | |
| | 1,500 | | | | | | | |
| | 500 | | | | | | | |
| | 200 | | | | | | | |
| | 300 | | | | | | | |
| | 13,700 | | | | | | | |
| | 3,500 | | | | | | | |
| | 11,200 | | | | | | | |
| | 4,500 | | | | | | | |
| | 36,600 | | | | | | | |
| | 98,800 | | | | | | | |
| | 5,100 | | | | | | | |
| | 11,000 | | | | | | | |
| | 4,500 | | | | | | | |
| | 3,500 | | | | | | | |
| | 1,500 | | | | | | | |
| | 500 | | | | | | | |
| | 200 | | | | | | | |
| | 300 | | | | | | | |
| | 13,700 | | | | | | | |
| | 3,500 | | | | | | | |
| | 11,200 | | | | | | | |
| | 4,500 | | | | | | | |
| | 36,600 | | | | | | | |
| | 98,800 | | | | | | | |
| | 5,100 | | | | | | | |
| | 11,000 | | | | | | | |
| | 4,500 | | | | | | | |
| | 3,500 | | | | | | | |
| | 1,500 | | | | | | | |
| | 500 | | | | | | | |
| | 200 | | | | | | | |
| | 300 | | | | | | | |
| | 13,700 | | | | | | | |
| | 3,500 | | | | | | | |
| | 11,200 | | | | | | | |
| | 4,500 | | | | | | | |
| | 36,600 | | | | | | | |
| | 98,800 | | | | | | | |
| | 5,100 | | | | | | | |
| | 11,000 | | | | | | | |
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| | 3,500 | | | | | | | |
| | 1,500 | | | | | | | |
| | 500 | | | | | | | |
| | 200 | | | | | | | |
| | 300 | | | | | | | |
| | 13,700 | | | | | | | |
| | 3,500 | | | | | | | |
| | 11,200 | | | | | | | |
| | 4,500 | | | | | | | |
| | 36,600 | | | | | | | |
| | 98,800 | | | | | | | |
| | 5, | | | | | | | |

BREAK-DOWN NO. 16—RUBBER

| Progressive distribu- tion no. | Expenditure for rubber by other industries | | | | | | | Distribution to— | | | | | | | | | |
|---|--|-----------------------|-----------|--------------------------|----------|----------|-------------------------------|----------------------------------|--|----------------------------------|--------------------------------------|----------------------------|------------------|--|----------------------------|--|--|
| | Source | Amount | Total | Salaries and wages | Interest | Margin | No. 2, trans- portation | No. 3, plant and equipment | No. 4, aggregate, quar- tying | No. 5, insurance and taxes | No. 8, petro- leum products | No. 9, coal and coke | No. 10, power | No. 13, ad- vertising and deve- lopment | No. 15, labora- tory | No. 18, agri- cultural products | |
| 3 | Plant and equipment..... | \$732,200 | \$154,400 | \$31,200 | \$41,700 | \$84,000 | \$18,300 | \$15,700 | \$400 | \$5,200 | \$2,000 | \$10,800 | \$344,400 | | | | |
| 4 | Do..... | 353,900 | 74,600 | 7,400 | 20,100 | 15,100 | 8,800 | 7,600 | 200 | 1,000 | 2,500 | 4,300 | 5,200 | 166,500 | | | |
| 5 | Do..... | 196,000 | 41,300 | 4,100 | 11,200 | 8,300 | 22,500 | 4,900 | 4,200 | 100 | 500 | 1,400 | 2,400 | 2,900 | 92,200 | | |
| 6 | Do..... | 80,000 | 16,900 | 1,700 | 4,500 | 3,400 | 9,100 | 2,000 | 1,700 | 300 | 600 | 1,000 | 1,200 | 1,200 | 37,600 | | |
| 7 | Accruals from distribution 6..... | { 37,400 192,000 } | 129,400 | 27,300 | 2,700 | 7,400 | | | | | | | | | | | |
| | Total..... | | 1,491,500 | 314,500 | 31,200 | 84,900 | | | | | | | | | | | |
| | | | | | | | | | | | | | | | 430,600 | | |

¹ Collected value of business transacted in subsequent distributions Details of derivation not shown

TABLE 12.—Expenditure of \$100,000,000 for highways traced progressively through various industries until it ultimately reaches salaries and wages, interest, and margin—Contd.

BREAK-DOWN NO. 17-BRICK

[Figures in parentheses at heads of columns are percentages, from table 5, applied in making distributions]

| Progressive dis- tribution no. | Expenditures for brick by other industries | | | | | | Distribution to— | | | | | | | |
|---|--|----------|----------|-----------------------|----------|---------|-------------------------------|----------------------------------|------------------------------------|-----------------------------------|-------------------------|------------------|--|-----------------------|
| | Source | Amount | Total | Salaries and wages | Interest | Margin | No. 2, transporta- tion | No. 3, plant and equipment | No. 5, in- surance and taxes | No. 8, pe- troleum products | No. 9, coal and coke | No. 10, power | No. 13, ad- vertising and devel- opment | No. 15, laboratory |
| 2 | Highway construction..... | \$97,900 | \$45,500 | \$3,200 | \$14,620 | (14.62) | (6.72) | (9.87) | (4.50) | (3.84) | (3.30) | (3.46) | (2.70) | (1.18) |
| 3 | Plant and equipment..... | 234,600 | 273,200 | 127,100 | 9,000 | 39,900 | \$6,600 | \$9,700 | \$4,400 | \$3,800 | \$3,200 | \$3,400 | \$2,600 | \$1,200 |
| 4 | Transportation..... | 38,600 | 113,400 | 123,600 | 57,500 | 4,100 | 18,100 | 8,300 | 12,200 | 10,500 | 9,000 | 9,400 | 7,400 | 3,200 |
| 5 | Plant and equipment..... | 10,200 | 62,800 | 67,700 | 31,500 | 2,200 | 9,900 | 4,600 | 6,700 | 5,600 | 4,700 | 4,100 | 4,300 | 1,400 |
| 6 | Transportation..... | 4,900 | 26,600 | 27,700 | 12,900 | 900 | 4,100 | 1,900 | 2,700 | 2,200 | 3,100 | 2,600 | 2,300 | 800 |
| 7 | Accruals from distribution 6..... | 2,100 | 12,900 | 20,000 | 9,300 | 700 | 2,900 | 1,200 | 1,100 | 900 | 1,100 | 900 | 1,000 | 700 |
| | Total..... | 17,100 | 610,100 | 283,800 | 610,100 | 283,800 | 20,100 | 20,100 | 20,100 | 20,100 | 89,200 | 89,200 | 393,100 | |

BREAK-DOWN NO. 18—AGRICULTURAL PRODUCTS

| Progressive distribution no. | Expenditure for agricultural products by other industries | | | | | Distribution to— | | | | |
|--------------------------------|---|-----------|----------|--------------------|----------|------------------|-----------------------|----------------------------|----------------------------|---------------------------|
| | Source | Amount | Total | Salaries and wages | Interest | Margin | No. 2, transportation | No. 3, plant and equipment | No. 5, insurance and taxes | No. 8, petroleum products |
| 4 Container Rubber | \$24,100 344,400 | \$368,500 | (24.23) | (13.68) | (11.88) | (3.00) | (32.80) | (8.48) | (3.26) | (2.67) |
| 5 Container Rubber | 6,300 166,500 | 172,800 | \$89,300 | \$50,400 | \$43,800 | \$11,100 | \$120,900 | \$31,200 | \$12,000 | \$9,800 |
| 6 Container Rubber | 1,500 92,200 | 93,700 | 41,900 | 23,600 | 20,500 | 5,200 | 56,700 | 14,700 | 5,600 | 4,600 |
| 7 Accruals from distribution 6 | 38,400 1,38,800 | 77,200 | 18,700 | 12,700 | 11,100 | 2,800 | 30,700 | 8,000 | 3,100 | 2,500 |
| Total | 712,200 | 172,600 | 97,300 | 84,600 | 354,500 | | | | | |

BREAK-DOWN NO. 19-PIPE

BREAK-DOWN NO. 20—NONFERROUS-METALS REFINING

PROGRESSIVE DISTRIBUTION OF HIGHWAY-CONSTRUCTION EXPENDITURES

31

| Progressive distribution no. | Expenditure for nonferrous-metals refining by other industries | Source | Amount | Total | Salaries and wages | Interest | Margin | Distribution to— | | | | | |
|------------------------------|--|-------------|----------|-----------|--------------------|----------|----------|-----------------------|----------------------------|----------------------------|---------------------------|----------------------|---------------|
| | | | | | | | | No. 2, transportation | No. 3, plant and equipment | No. 5, insurance and taxes | No. 8, petroleum products | No. 9, coal and coke | No. 10, power |
| 3 | Plant and equipment | \$227,500 | (9.19) | (1.22) | (4.35) | (10.80) | (5.34) | (0.96) | (1.11) | (0.78) | (64.29) | (0.81) | (0.27) |
| | Transportation | 66,700 | \$46,700 | \$6,200 | \$22,100 | \$54,900 | \$27,100 | \$34,900 | \$5,600 | \$4,100 | \$326,800 | \$4,000 | \$1,400 |
| | Iron and steel | 214,100 | | | | | | | | | | | |
| | Container | 1,200 | | | | | | | | | | | |
| 4 | Laboratory | 82,200 | | | | | | | | | | | |
| | Plant and equipment | 110,000 | 35,800 | 4,700 | 17,000 | 42,000 | 20,700 | 3,700 | 4,300 | 3,400 | 250,200 | 3,100 | 1,100 |
| | Transportation | 17,700 | | | | | | | | | | | |
| | Iron and steel | 178,100 | | | | | | | | | | | |
| | Container | 300 | | | | | | | | | | | |
| 5 | Laboratory | 16,400 | | | | | | | | | | | |
| | Plant and equipment | 60,900 | 156,700 | 14,400 | 1,900 | 6,800 | 16,900 | 8,400 | 1,500 | 1,800 | 1,400 | 1,300 | 1,200 |
| | Transportation | 8,400 | | | | | | | | | | | |
| | Iron and steel | 70,700 | | | | | | | | | | | |
| | Container | 100 | | | | | | | | | | | |
| 6 | Laboratory | 7,200 | | | | | | | | | | | |
| | Plant and equipment | 24,900 | 69,800 | 6,400 | 900 | 3,000 | 7,500 | 3,700 | 700 | 800 | 600 | 600 | 44,900 |
| | Transportation | 3,500 | | | | | | | | | | | |
| | Iron and steel | 34,100 | | | | | | | | | | | |
| 7 | Accruals from distribution 6 | { 1,175,900 | | 206,400 | 19,000 | 2,500 | 9,000 | | | | | | |
| | Total | ----- | | 1,330,400 | 122,300 | 16,200 | 57,900 | | | | | | |
| | | | | | 1,330,400 | 196,400 | | | | | | | |

BREAKDOWN NO. 21—CONTAINER

| Progressive distribution no. | Expenditure for container by other industries | Source | Amount | Total | Salaries and wages | Interest | Margin | Distribution to— | | | | | (0.52) |
|------------------------------|---|----------|-------------|----------|--------------------|----------|----------|-----------------------|----------------------------|----------------------------|-----------------------|---------------------------|----------|
| | | | | | | | | No. 2, transportation | No. 3, plant and equipment | No. 5, insurance and taxes | No. 7, iron and steel | No. 8, petroleum products | |
| 3 | Petroleum products | \$96,400 | { \$221,100 | (21.07) | (1.83) | (6.80) | (4.53) | (6.86) | (3.22) | (28.03) | (0.18) | (0.14) | (0.43) |
| | Cement | 124,700 | 21,800 | \$46,600 | \$4,000 | \$15,000 | \$10,000 | \$15,200 | \$7,100 | \$62,000 | \$400 | \$1,800 | \$32,400 |
| 4 | Petroleum products | 57,400 | 12,100 | 1,100 | 3,900 | 2,600 | 3,900 | 1,800 | 16,100 | 100 | 500 | 8,400 | 200 |
| | Cement | 1,900 | | | | | | | | | | | |
| | Explosives | 33,700 | | | | | | | | | | | |
| 5 | Petroleum products | 6,300 | 900 | 13,600 | 2,900 | 300 | 900 | 600 | 900 | 400 | 3,800 | 100 | 2,000 |
| | Cement | 6,400 | | | | | | | | | | | |
| | Explosives | 3,200 | | | | | | | | | | | |
| 6 | Petroleum products | 3,400 | 7,400 | 1,600 | 100 | 500 | 300 | 500 | 200 | 2,100 | | | |
| | Cement | 3,800 | | | | | | | | | | | |
| 7 | Explosives | { 3,400 | 11,300 | 2,400 | 200 | 800 | | | | | | | |
| | Accruals from distribution 6 | { 17,900 | | | | | | | | | | | |
| | Total | ----- | | 310,800 | 65,600 | 5,700 | 21,100 | | | | | | |
| | | | | | 310,800 | 65,600 | 5,700 | 21,100 | | | | | |
| | | | | | | 92,400 | | | | | | | |

¹ Calculated value of business transacted in subsequent distributions. Details of derivation not shown.

Progressive distribution no. 1 in table 12 repeats from table 4 the distribution of an original \$100,000,000 highway expenditure to salaries and wages, interest, margin, and various industries. In this and subsequent distributions the items salaries and wages, interest, and margin are set aside for later collection and analysis. The amounts assigned to industries in distribution no. 1 are now transferred to the corresponding industry break-downs of table 12, in preparation for distribution no. 2. For example, break-down no. 1 of table 12 shows \$14,332,600 assigned to the cement industry. This item appears in break-down no. 6, distribution no. 2. Similarly, other items of break-down no. 1 are entered under the proper industries and analyzed as distribution no. 2. The analysis is made by applying the percentages derived in table 5. A total of \$71,211,500 is distributed in this manner as distribution no. 2.

In making distribution no. 3 the procedure of distribution no. 2 is followed, except that amounts for distribution may come from one or several of the industries. For example, examining distribution no. 2 of all industries it is found that only the plant and equipment industry and the transportation industry contrib-

ute to the cement industry and in the amounts of \$190,500 and \$31,600, respectively. These amounts are entered in break-down no. 6 for the cement industry for analysis as distribution no. 3. The second column of table 12 shows, in all cases, the sources from which the amounts are derived. All new entries are from the preceding distribution. The total amount analyzed in distribution no. 3 is \$32,794,200.

These processes are repeated in progressive distributions, each distribution adding increments to salaries and wages, interest, and margin, and reducing the amount remaining for further distribution. The third distribution leaves \$14,743,600 for further analysis, the fourth \$6,583,300, the fifth \$2,979,400, and the sixth leaves only \$1,335,600. This amount is assigned to industries and then distributed to salaries and wages, interest, and margin, in the amounts accruing to the various industries from distribution no. 6. The result is shown as distribution no. 7.

Table 13 is a summary of table 12 and shows the value of business transacted by each industry and the amounts finally assigned to salaries and wages, interest, and margin as a result of the distributions.

TABLE 13.—*Steps in the distribution of \$100,000,000 highway construction expenditure, without reinvestment*

| Break-down no. | Item | Original expenditure | Progressive distribution no.— | | | | | | |
|----------------|----------------------------------|----------------------|-------------------------------|--------------|--------------|--------------|--------------|--------------|-------------|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | Salaries and wages..... | \$24,391,000 | \$51,856,600 | \$64,455,000 | \$70,158,400 | \$72,663,700 | \$73,803,900 | \$74,726,000 | |
| | Interest..... | 1,385,400 | 4,735,000 | 6,598,300 | 7,408,400 | 7,773,700 | 7,941,100 | 8,077,600 | |
| | Margin..... | 3,012,100 | 10,614,200 | 14,203,100 | 15,849,900 | 16,583,200 | 16,919,400 | 17,196,400 | |
| 1 | Highway construction..... | \$100,000,000 | | | | | | | |
| 2 | Transportation..... | 17,544,100 | 4,667,300 | 2,213,100 | 929,600 | 436,500 | 190,600 | | |
| 3 | Plant and equipment..... | 14,217,100 | 6,873,200 | 3,805,900 | 1,553,900 | 725,400 | 327,100 | | |
| 4 | Aggregate, quarrying..... | 11,220,300 | 1,418,000 | 391,400 | 122,900 | 60,800 | 26,900 | | |
| 5 | Insurance and taxes..... | 8,133,100 | 3,753,800 | 1,480,500 | 659,500 | 293,300 | 135,300 | | |
| 6 | Cement..... | 14,332,600 | 222,100 | 100,500 | 55,000 | 22,500 | 10,500 | | |
| 7 | Iron and steel..... | 4,811,700 | 4,002,000 | 1,588,400 | 766,600 | 314,000 | 146,800 | | |
| 8 | Petroleum products..... | 4,592,600 | 1,037,900 | 299,500 | 150,400 | 69,400 | 31,600 | | |
| 9 | Coal and coke..... | 1,831,200 | 654,600 | 274,600 | 128,400 | 55,400 | | | |
| 10 | Power..... | 1,619,500 | 441,800 | 230,000 | 106,500 | 47,900 | | | |
| 11 | Metallic-ore mining..... | 558,900 | 1,041,200 | 533,700 | 237,500 | 100,900 | | | |
| 12 | Forestry products..... | 534,600 | 724,500 | 418,400 | 197,700 | 81,700 | 38,000 | | |
| 13 | Advertising and development..... | | 1,319,900 | 485,400 | 224,900 | 99,900 | 45,400 | | |
| 14 | Explosives..... | | 1,603,700 | 305,800 | 178,900 | 81,100 | 36,900 | | |
| 15 | Laboratory..... | | 1,127,400 | 224,500 | 98,800 | 43,800 | 19,700 | | |
| 16 | Rubber..... | | 732,200 | 353,900 | 196,000 | 80,000 | 37,400 | | |
| 17 | Brick..... | 97,900 | 273,200 | 123,600 | 67,700 | 27,700 | 12,900 | | |
| 18 | Agricultural products..... | | | 368,500 | 172,800 | 93,700 | 38,400 | | |
| 19 | Pipe..... | 727,500 | | | | | | | |
| 20 | Nonferrous-metals refining..... | | 508,300 | 389,200 | 156,700 | 69,800 | 30,500 | | |
| 21 | Container..... | | 221,100 | 57,400 | 13,600 | 7,400 | 3,400 | | |
| | Total..... | 100,000,000 | 71,211,500 | 32,794,200 | 14,743,600 | 6,583,300 | 2,979,400 | 1,335,600 | |
| | Grand total..... | 100,000,000 | 100,000,000 | 100,000,000 | 100,000,000 | 100,000,000 | 100,000,000 | 100,000,000 | 100,000,000 |

Table 14 lists, by industries, the amounts shown in table 12 as going to salaries and wages, and to interest and margin, which were set aside for later consideration. Table 14 also shows the total value of business in each industry resulting from an expenditure on highways of \$100,000,000. This expenditure results

in payments to labor on the job, in transportation, and in the manufacture of materials and machinery of \$74,726,000. Such payments result from the investment in highways. Payments to labor resulting from reinvestment of margin and interest expenses are considered later.

TABLE 14.—Summary from table 12 of salaries and wages, interest, margin, and value of business for each industry without reinvestment

| Break-down no. | Industry | Salaries and wages | Interest | Margin | Total | Value of business |
|----------------|-----------------------------|--------------------|-------------|-------------|--------------|-------------------|
| 1 | Highway construction | \$24,391,000 | \$1,385,400 | \$3,012,100 | \$28,788,500 | \$100,000,000 |
| 2 | Transportation | 13,489,600 | 1,084,200 | 3,745,000 | 18,318,800 | 26,061,800 |
| 3 | Plant and equipment | 11,169,000 | 1,310,600 | 4,555,200 | 17,034,800 | 27,707,600 |
| 4 | Aggregate, quarrying | 5,538,000 | 322,500 | 713,800 | 6,574,300 | 13,267,600 |
| 5 | Insurance and taxes | 4,486,500 | 1,240,900 | | 5,727,400 | 9,545,700 |
| 6 | Cement | 3,681,000 | 576,800 | 1,136,400 | 5,694,200 | 14,759,900 |
| 7 | Iron and steel | 2,707,100 | 316,500 | 796,300 | 3,819,900 | 11,941,600 |
| 8 | Petroleum products | 1,852,200 | 340,500 | 811,800 | 3,004,500 | 6,215,000 |
| 9 | Coal and coke | 1,821,000 | 152,100 | 180,900 | 2,154,000 | 2,965,000 |
| 10 | Power | 534,900 | 392,300 | 690,800 | 1,618,000 | 2,470,900 |
| 11 | Metallic-ore mining | 1,030,200 | 90,700 | 323,000 | 1,443,900 | 2,872,000 |
| 12 | Forestry products | 1,067,300 | 63,700 | 203,900 | 1,334,900 | 2,014,200 |
| 13 | Advertising and development | 831,400 | 129,800 | 177,000 | 1,138,200 | 2,218,500 |
| 14 | Explosives | 465,600 | 114,400 | 294,600 | 874,600 | 2,265,200 |
| 15 | Laboratory | 567,200 | 70,000 | 170,500 | 807,700 | 1,531,900 |
| 16 | Rubber | 314,500 | 31,200 | 84,900 | 430,600 | 1,491,500 |
| 17 | Brick | 283,800 | 20,100 | 89,200 | 393,100 | 610,100 |
| 18 | Agricultural products | 172,600 | 97,300 | 84,600 | 354,500 | 712,200 |
| 19 | Pipe | 135,200 | 16,700 | 47,400 | 199,300 | 727,500 |
| 20 | Nonferrous-metals refining | 122,300 | 16,200 | 57,900 | 196,400 | 1,330,400 |
| 21 | Container | 65,600 | 5,700 | 21,100 | 92,400 | 310,800 |
| | Total | 74,726,000 | 8,077,600 | 17,196,400 | 100,000,000 | 231,019,400 |

Of the original expenditure, \$8,077,600 accrues as interest and \$17,196,400 accrues as margin, making a total of \$25,274,000 available for reinvestment. The reinvestment is partly in the field of producer goods and partly in the field of consumer goods.

Accruals to margin are divided into payments as dividends, 59.82 percent or \$10,286,600, and payments as surplus, 40.18 percent or \$6,909,800. These proportions were determined by examination of the financial statements of establishments in the industries involved.

Interest, \$8,077,600, and dividends, \$10,286,600, are collected into a single item representing income to the recipients. Such payments are further divided into large incomes, 37.84 percent or \$6,949,800, and small incomes, 62.16 percent or \$11,414,400. This division is made on the basis of income-tax returns indicating the relative proportions of large and small incomes (46).

Large incomes—above \$10,000 per annum—are assumed to be available for reinvestment in producer goods and small incomes are assumed to be spent entirely for the cost of living. There is some error in each of these assumptions, but the errors tend to cancel each other. The division of large and small incomes about an income of \$25,000 per annum would not materially alter the assumption. Small incomes, large in number, have small balances available for

reinvestment in producer goods. Large incomes, small in number, have large balances available for reinvestment in producer goods and are expended in relatively small amounts for consumer goods. Any error in the assumption that these results are compensating should have little effect on the ultimate analysis.

Large incomes, \$6,949,800, and surplus, \$6,909,800, are collected into a single item, \$13,859,600, and assigned to the field of producer goods for reinvestment. The percentages for use in distribution to the producer-goods field have already been established and summarized in table 14. Before proceeding further with the distribution of reinvestment items, it is necessary to establish a distribution of expenditures in the field of consumer goods. For this purpose the amount assigned to small incomes, \$11,414,400, will be further analyzed.

The recipients of small incomes from investment are closely identified with the small-salary and small-wage group. The individuals comprising this class expend their income for living expenses—food, clothing, housing, amusements, and contingencies. The total expenditures by all such individuals are spread throughout the entire field of retail trade. Therefore, in this analysis, it is logical to assign consumer-goods expenditures to items composing the retail-trade industry.

DISTRIBUTION OF EXPENDITURES FOR CONSUMER GOODS

The first distribution of expenditures for consumer goods is shown in break-down no. 22 of table 15. In this distribution salaries and wages, interest, and margin items are set aside, and the remainder is assigned to other industries. The amount distributed to wholesale trade is subsequently broken down in distribution no. 2. In this distribution, salaries and wages, interest, and margin items are again set aside and manufacturing forms a considerable percentage of the remainder. Other industries are assigned amounts which are transferred and accumulated for progressive distribution by a procedure identical

with that used in the progressive distributions in table 12. Distribution of consumer-goods expenditures involve, with one exception (break-down no. 19), all industries previously involved in the distributions of table 12 and the addition of three new industries.

Table 16 is a summary of the steps in the distribution of consumer-goods expenditures. For each step, the total accumulations to salaries and wages, interest, and margin are shown together with the amounts remaining for further distribution. The final step establishes the percentage distribution of consumer expenditures.

ANALYSIS OF HIGHWAY-CONSTRUCTION EXPENDITURES

TABLE 15.—*Reinvestment in consumer goods traced progressively through various industries until ultimately paid as salaries and wages or to interest and margin*

BREAK-DOWN NO. 22—RETAIL TRADE

[Figures in parentheses at heads of columns are percentages, from table 5, applied in making distributions]

| Progressive distribution no. | Expenditures in retail trade by other industries | | | Distribution to— | | | | | | | | | |
|------------------------------|--|--------------|-------------|--------------------|-----------|-------------|------------------------|----------------------------|----------------------------|---------------------------|---------------|-------------------------------------|-------------------------|
| | Source | Amount | Total | Salaries and wages | Interest | Margin | No. 2, transpor-tation | No. 3, plant and equipment | No. 5, insurance and taxes | No. 8, petroleum products | No. 10, power | No. 13, advertising and development | No. 23, wholesale trade |
| 1 Consumer goods | \$11,414,400 | \$11,414,400 | \$1,630,000 | \$133,500 | \$603,800 | \$1,349,200 | \$526,200 | \$143,800 | \$24,000 | \$119,900 | \$14,800 | (6.18) | \$6,869,200 |
| Total | | | 11,414,400 | 2,367,300 | | | | | | | | (0.13) | |

| BREAK-DOWN NO. 23—WHOLESALE TRADE | | | | | | | | | | | | | |
|-----------------------------------|--|-------------|-----------|--------------------|-----------|-----------|------------------------|----------------------------|----------------------------|---------------------------|---------------|-------------------------------------|-------------------------------|
| Progressive distribution no. | Expenditure in wholesale trade by other industries | | | Distribution to— | | | | | | | | | |
| | Source | Amount | Total | Salaries and wages | Interest | Margin | No. 2, transpor-tation | No. 3, plant and equipment | No. 5, insurance and taxes | No. 8, petroleum products | No. 10, power | No. 13, advertising and development | No. 18, agricultural products |
| 2 Retail trade | \$6,869,200 | \$6,869,200 | \$535,800 | \$170,400 | \$722,700 | \$232,100 | \$403,200 | \$210,200 | \$151 | \$176 | \$114,800 | (50.40) | \$3,462,100 |
| Total | | | 6,869,200 | 1,428,900 | | | | | | | | (8.62) | |

| BREAK-DOWN NO. 24—MANUFACTURING | | | | | | | | | | | | | |
|---------------------------------|---|-------------|-------------|--------------------|-----------|----------|------------------------|----------------------------|----------------------------|---------------------------|----------------------|---------------|---------------------------|
| Progressive distribution no. | Expenditure for manufacturing by other industries | | | Distribution to— | | | | | | | | | |
| | Source | Amount | Total | Salaries and wages | Interest | Margin | No. 2, transpor-tation | No. 3, plant and equipment | No. 5, insurance and taxes | No. 8, petroleum products | No. 9, coal and coke | No. 10, power | No. 12, forestry products |
| 3 Wholesale trade | \$3,462,100 | \$3,462,100 | \$1,090,900 | \$308,100 | \$209,400 | \$66,200 | \$513,100 | \$120,200 | \$113,600 | \$70,600 | \$32,200 | \$155,400 | \$44,300 |
| Total | | | 3,462,100 | 1,608,400 | | | | | | | | (1.28) | (19.26) |

DISTRIBUTION OF EXPENDITURES FOR CONSUMER GOODS

ANALYSIS OF HIGHWAY-CONSTRUCTION EXPENDITURES

TABLE 15.—Reinvestment in consumer goods traced progressively through various industries until ultimately paid as salaries and wages or to interest and margin—Continued

BREAK-DOWN NO. 2—TRANSPORTATION—Continued

[Figures in parentheses at heads of columns are percentages, from table 5, applied in making distributions]

| Progressive distribution no. | Expenditure for transportation by other industries | | | | Distribution to— | | | | | | | | | | | |
|------------------------------|--|-----------------------------|--------------------|----------|------------------|-----------------------------|----------------------------|---------------|-----------------------|---------------------------|----------------------|---------------|---------------------------|-------------------------------------|--------------------|---------------|
| | Source | Amount | Salaries and wages | Interest | Margin | No. 4, aggregate, quarrying | No. 5, insurance and taxes | No. 6, cement | No. 7, iron and steel | No. 8, petroleum products | No. 9, coal and coke | No. 10, power | No. 12, forestry products | No. 13, advertising and development | No. 15, laboratory | No. 17, brick |
| | | (51.76) | (4.16) | (14.37) | (0.37) | (9.14) | (0.18) | (10.58) | (0.42) | (3.12) | (0.39) | (1.65) | (2.17) | (1.09) | (0.22) | (0.38) |
| 7 | Plant and equipment | 4,700 | | | | | | | | | | | | | | |
| | Aggregate, quarrying | 500 | | | | | | | | | | | | | | |
| | Insurance and taxes | 4,500 | | | | | | | | | | | | | | |
| | Cement | 700 | | | | | | | | | | | | | | |
| | Iron and steel | 14,800 | | | | | | | | | | | | | | |
| | Petroleum products | 1,800 | | | | | | | | | | | | | | |
| | Coal and coke | 300 | | | | | | | | | | | | | | |
| | Power | 500 | | | | | | | | | | | | | | |
| | Metallic-ore mining | 3,400 | | | | | | | | | | | | | | |
| | Forestry products | 1,700 | | | | | | | | | | | | | | |
| | Advertising and development | 700 | | | | | | | | | | | | | | |
| | Explosives | 800 | | | | | | | | | | | | | | |
| | Laboratory | 500 | | | | | | | | | | | | | | |
| | Rubber | 1,000 | | | | | | | | | | | | | | |
| | Brick | 300 | | | | | | | | | | | | | | |
| | Agricultural products | 800 | | | | | | | | | | | | | | |
| | Nonferrous-metals refining | 1,700 | | | | | | | | | | | | | | |
| | Container | 100 | | | | | | | | | | | | | | |
| 8 | Accruals from distribution 7.. | { 17,100 17,300 } 24,400 | 12,600 | 1,000 | 3,500 | | | | | | | | | | | |
| | Total | 2,154,300 | 1,115,000 | 89,600 | 309,600 | 1,514,200 | | | | | | | | | | |

BREAK-DOWN NO. 3—PLANT AND EQUIPMENT

| Progressive distribution no. | Expenditure for plant and equipment by other industries | | | | Distribution to— | | | | | | | | | | | | | | |
|------------------------------|---|---------|--------------------|----------|------------------|-----------------------|-----------------------------|----------------------------|---------------|-----------------------|---------------------------|----------------------|---------------|---------------------------|-------------------------------------|--------------------|----------------|---------------|-------------------------------------|
| | Source | Amount | Salaries and wages | Interest | Margin | No. 2, transportation | No. 4, aggregate, quarrying | No. 5, insurance and taxes | No. 6, cement | No. 7, iron and steel | No. 8, petroleum products | No. 9, coal and coke | No. 10, power | No. 12, forestry products | No. 13, advertising and development | No. 15, laboratory | No. 16, rubber | No. 17, brick | No. 20, non-ferrous-metals refining |
| 2 | Retail trade | 526,200 | \$212,100 | \$24,900 | \$86,500 | \$19,000 | \$4,200 | \$22,000 | \$7,100 | \$67,100 | \$3,400 | \$1,300 | \$3,400 | \$16,100 | \$10,000 | \$4,900 | \$27,100 | \$8,700 | |
| | Insurance and taxes | 46,300 | 474,700 | 191,400 | 22,500 | 78,000 | 17,200 | 3,800 | 19,800 | 6,400 | 60,500 | 3,100 | 1,200 | 3,000 | 14,500 | 9,000 | 4,400 | 24,500 | 7,800 |
| 3 | Wholesale trade | 15,800 | 403,200 | 1,500 | 119,100 | | | | | | | | | | | | | | 7,600 |
| | Aggregate, quarrying | 1,500 | | | | | | | | | | | | | | | | | |
| | Cement | 1,500 | | | | | | | | | | | | | | | | | |
| | Iron and steel | 20,100 | | | | | | | | | | | | | | | | | |
| | Petroleum products | 26,800 | | | | | | | | | | | | | | | | | |
| | Coal and coke | 7,600 | | | | | | | | | | | | | | | | | |
| | Power | 17,100 | | | | | | | | | | | | | | | | | |
| | Metallic-ore mining | 19,100 | | | | | | | | | | | | | | | | | |
| | Forestry products | 11,000 | 979,600 | 394,900 | 46,300 | 161,000 | 35,500 | 7,800 | 40,900 | 13,100 | 124,900 | 6,400 | 2,500 | 6,300 | 30,000 | 18,600 | 9,100 | 50,400 | 16,200 |
| | Advertising and development | 41,100 | | | | | | | | | | | | | | | | | |
| | Laboratory | 2,300 | | | | | | | | | | | | | | | | | |
| | Rubber | 3,100 | | | | | | | | | | | | | | | | | |
| | Brick | 1,300 | | | | | | | | | | | | | | | | | |
| | Agricultural products | 194,200 | | | | | | | | | | | | | | | | | |
| | Nonferrous-metals refining | 513,100 | | | | | | | | | | | | | | | | | |

15,700

DISTRIBUTION OF EXPENDITURES FOR CONSUMER GOODS

¹ Calculated value of business created in subsequent distributions. Details of derivation not shown.

TABLE 15.—Reinvestment in consumer goods traced progressively through various industries until ultimately paid as salaries and wages or to interest and margin—Continued

BREAK-DOWN NO. 4—AGGREGATE, QUARRYING

Figures in parentheses at heads of columns are percentages, from table 5, applied in making distributions

ANALYSIS OF HIGHWAY-CONSTRUCTION EXPENDITURES

BREAK-DOWN NO. 5—INSURANCE AND TAXES

Calculated value of business created in subsequent distributions Details of derivation not shown.

ANALYSIS OF HIGHWAY-CONSTRUCTION EXPENDITURES

TABLE 15.—Reinvestment in consumer goods traced progressively through various industries until ultimately paid as salaries and wages or to interest and margin—Continued

BREAK-DOWN NO. 6—CEMENT

Figures in parentheses at heads of columns are percentages, from table 5, applied in making distributions

BREAK-DOWN NO. 8—PETROLEUM PRODUCTS

DISTRIBUTION OF EXPENDITURES FOR CONSUMER GOODS

41

| Progressive distribution no. | Source | Amount | Total | Salaries and wages | Interest | Margin | No. 2, transportation | No. 3, plant and equipment | No. 4, aggregate, quarrying | No. 5, insurance and taxes | No. 9, coal and coke | No. 10, power | No. 15, laboratory | Distribution to— | | | |
|------------------------------|-----------------------------------|----------|----------|--------------------|----------|---------|-----------------------|----------------------------|-----------------------------|----------------------------|----------------------|---------------|--------------------|-------------------------------------|-------------------|--------|-------|
| | | | | | | | | | | | | | | No. 18, advertising and development | No. 21, container | | |
| 2 | Retail trade..... | \$24,000 | \$24,000 | (\$29,80) | (\$5,48) | (13,06) | (16,45) | (23,20) | (0.77) | \$200 | \$5,600 | \$3,900 | \$3,100 | \$1,300 | \$1,200 | (2.10) | |
| | Transportation..... | 5,700 | | | | | | | | | | | | | | | \$500 |
| | Plant and equipment..... | 3,400 | | | | | | | | | | | | | | | |
| | Power..... | 2,600 | | | | | | | | | | | | | | | 2,400 |
| 3 | Advertising and development..... | 103,700 | | | | | | | | | | | | | | | |
| | Wholesale trade..... | 1,100 | | | | | | | | | | | | | | | |
| | Transportation..... | 3,100 | | | | | | | | | | | | | | | |
| | Plant and equipment..... | 300 | | | | | | | | | | | | | | | |
| | Cement..... | 300 | | | | | | | | | | | | | | | |
| | Iron and steel..... | 2,200 | | | | | | | | | | | | | | | |
| | Coal and coke..... | 500 | | | | | | | | | | | | | | | |
| | Power..... | 2,800 | | | | | | | | | | | | | | | |
| 4 | Metallic-ore mining..... | 4,200 | | | | | | | | | | | | | | | |
| | Forestry products..... | 1,400 | | | | | | | | | | | | | | | |
| | Advertising and development..... | 2,100 | | | | | | | | | | | | | | | |
| | Laboratory..... | 100 | | | | | | | | | | | | | | | |
| | Brick..... | 400 | | | | | | | | | | | | | | | |
| | Agricultural products..... | 19,300 | | | | | | | | | | | | | | | |
| | Nonferrous-metals refining..... | 100 | | | | | | | | | | | | | | | |
| | Manufacturing..... | 113,600 | | | | | | | | | | | | | | | |
| | Transportation..... | 900 | | | | | | | | | | | | | | | |
| | Plant and equipment..... | 6,400 | | | | | | | | | | | | | | | |
| | Aggregate, quarrying..... | 300 | | | | | | | | | | | | | | | |
| | Cement..... | 200 | | | | | | | | | | | | | | | |
| | Iron and steel..... | 1,000 | | | | | | | | | | | | | | | |
| | Coal and coke..... | 1,800 | | | | | | | | | | | | | | | |
| | Power..... | 6,100 | | | | | | | | | | | | | | | |
| 5 | Metallic-ore mining..... | 43,200 | | | | | | | | | | | | | | | |
| | Forestry products..... | 1,400 | | | | | | | | | | | | | | | |
| | Advertising and development..... | 1,000 | | | | | | | | | | | | | | | |
| | Explosives..... | 200 | | | | | | | | | | | | | | | |
| | Laboratory..... | 100 | | | | | | | | | | | | | | | |
| | Brick..... | 300 | | | | | | | | | | | | | | | |
| | Agricultural products..... | 22,200 | | | | | | | | | | | | | | | |
| | Nonferrous-metals refining..... | 200 | | | | | | | | | | | | | | | |
| | Transportation..... | 700 | | | | | | | | | | | | | | | |
| | Plant and equipment..... | 2,900 | | | | | | | | | | | | | | | |
| | Aggregate, quarrying..... | 400 | | | | | | | | | | | | | | | |
| | Cement..... | 500 | | | | | | | | | | | | | | | |
| | Iron and steel..... | 1,600 | | | | | | | | | | | | | | | |
| | Coal and coke..... | 200 | | | | | | | | | | | | | | | |
| | Power..... | 1,200 | | | | | | | | | | | | | | | |
| 6 | Metallic-ore mining..... | 900 | | | | | | | | | | | | | | | |
| | Forestry products..... | 1,900 | | | | | | | | | | | | | | | |
| | Advertising and development..... | 400 | | | | | | | | | | | | | | | |
| | Explosives..... | 300 | | | | | | | | | | | | | | | |
| | Laboratory..... | 100 | | | | | | | | | | | | | | | |
| | Brick..... | 600 | | | | | | | | | | | | | | | |
| | Agricultural products..... | 400 | | | | | | | | | | | | | | | |
| | Nonferrous-metals refining..... | 200 | | | | | | | | | | | | | | | |
| | Transportation..... | 400 | | | | | | | | | | | | | | | |
| | Plant and equipment..... | 800 | | | | | | | | | | | | | | | |
| | Aggregate, quarrying..... | 300 | | | | | | | | | | | | | | | |
| | Cement..... | 200 | | | | | | | | | | | | | | | |
| | Iron and steel..... | 800 | | | | | | | | | | | | | | | |
| | Coal and coke..... | 200 | | | | | | | | | | | | | | | |
| | Power..... | 300 | | | | | | | | | | | | | | | |
| 7 | Metallic-ore mining..... | 1,200 | | | | | | | | | | | | | | | |
| | Forestry products..... | 200 | | | | | | | | | | | | | | | |
| | Advertising and development..... | 200 | | | | | | | | | | | | | | | |
| | Explosives..... | 100 | | | | | | | | | | | | | | | |
| | Laboratory..... | 600 | | | | | | | | | | | | | | | |
| | Brick..... | 6,000 | | | | | | | | | | | | | | | |
| | Agricultural products..... | 800 | | | | | | | | | | | | | | | |
| | Nonferrous-metals refining..... | 200 | | | | | | | | | | | | | | | |
| | Accruals from distribution 7..... | 3,200 | | | | | | | | | | | | | | | |
| 8 | Total..... | 357,600 | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

1 Calculated value of business created in subsequent distributions. Details of derivation not shown.

ANALYSIS OF HIGHWAY-CONSTRUCTION EXPENDITURES

TABLE 15.—Reinvestment in consumer goods traced progressively through various industries until ultimately paid as salaries and wages or to interest and margin—Continued

BREAK-DOWN NO. 9-COAL AND COKE

[Figures in parentheses at heads of columns are percentages, from table 5, applied in making distribution]

DISTRIBUTION OF EXPENDITURES FOR CONSUMER GOODS

BREAK-DOWN NO. 10-POWER

| Expenditure for power by other industries | | | | | | | | | |
|---|-------------------------------|-----------|-----------|-----------------------|----------|---------|---------------------------------------|-------------------------------------|---|
| | Source | Amount | Total | Salaries and wages | Interest | Margin | No. 2, plant and equip- ment | No. 3, plant transporta- tion | Distribution to— |
| 2 | Retail trade. | \$119,900 | \$119,900 | (21,65) | (15,88) | (27,95) | \$33,500 | \$3,800 | No. 13, advertising and devel- opment (2,59) \$3,100 |
| | Transportation. | 5,300 | 5,300 | 3,400 | 3,400 | 3,000 | 3,000 | 3,000 | |
| 3 | Plant and equipment. | 139,500 | 139,500 | 28,300 | 20,700 | 36,500 | 4,200 | 17,100 | No. 9, coal and coke (3,02) \$3,600 |
| | Petroleum products. | 100 | 100 | 100 | 100 | 500 | 500 | 13,600 | |
| | Advertising and development. | 900 | 900 | 120,800 | 120,800 | 1,100 | 1,100 | 2,800 | 3,900 |
| | Wholesale trade. | 1,100 | 1,100 | 3,000 | 3,000 | 500 | 500 | 1,600 | 3,400 |
| | Transportation. | 3,000 | 3,000 | 500 | 500 | 500 | 500 | 500 | |
| | Plant and equipment. | 500 | 500 | 500 | 500 | 500 | 500 | 500 | |
| | Aggregate, quarrying. | 500 | 500 | 500 | 500 | 500 | 500 | 500 | |
| | Cement. | 1,800 | 1,800 | 300 | 300 | 300 | 300 | 300 | |
| | Iron and steel. | 300 | 300 | 300 | 300 | 300 | 300 | 300 | |
| | Petroleum products. | 300 | 300 | 300 | 300 | 300 | 300 | 300 | |
| | Coal and coke. | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 | |
| | Metallic-ore mining. | 9,100 | 9,100 | 4,600 | 80,100 | 17,300 | 12,700 | 22,500 | 1,800 |
| | Forestry products. | 4,600 | 4,600 | 9,200 | 9,200 | 100 | 100 | 10,500 | 2,400 |
| | Advertising and development. | 100 | 100 | 200 | 200 | 200 | 200 | 200 | 2,100 |
| | Laboratory. | 200 | 200 | 200 | 200 | 200 | 200 | 200 | |
| | Rubber. | 200 | 200 | 200 | 200 | 200 | 200 | 200 | |
| | Brick. | 400 | 400 | 15,800 | 15,800 | 100 | 100 | 100 | |
| | Agricultural products. | 400 | 400 | 32,200 | 32,200 | 100 | 100 | 100 | |
| | Nonferrous-metals refining. | 100 | 100 | 6,900 | 6,900 | 100 | 100 | 100 | |
| | Manufacturing. | 100 | 100 | 500 | 500 | 500 | 500 | 500 | |
| | Transportation. | 900 | 900 | 400 | 400 | 400 | 400 | 400 | |
| | Plant and equipment. | 300 | 300 | 400 | 400 | 400 | 400 | 400 | |
| | Aggregate, quarrying. | 500 | 500 | 500 | 500 | 500 | 500 | 500 | |
| | Cement. | 400 | 400 | 400 | 400 | 400 | 400 | 400 | |
| | Iron and steel. | 800 | 800 | 800 | 800 | 800 | 800 | 800 | |
| | Petroleum products. | 400 | 400 | 400 | 400 | 400 | 400 | 400 | |
| | Coal and coke. | 1,300 | 1,300 | 1,300 | 1,300 | 1,300 | 1,300 | 1,300 | |
| | Metallic-ore mining. | 4,600 | 4,600 | 4,600 | 4,600 | 4,600 | 4,600 | 4,600 | |
| | Forestry products. | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 | |
| | Advertising and development. | 300 | 300 | 300 | 300 | 300 | 300 | 300 | |
| | Explosives. | 300 | 300 | 300 | 300 | 300 | 300 | 300 | |
| | Laboratory. | 300 | 300 | 300 | 300 | 300 | 300 | 300 | |
| | Rubber. | 300 | 300 | 300 | 300 | 300 | 300 | 300 | |
| | Brick. | 300 | 300 | 300 | 300 | 300 | 300 | 300 | |
| | Agricultural products. | 300 | 300 | 300 | 300 | 300 | 300 | 300 | |
| | Nonferrous-metals refining. | 200 | 200 | 200 | 200 | 200 | 200 | 200 | |
| | Transportation. | 600 | 600 | 600 | 600 | 600 | 600 | 600 | |
| | Plant and equipment. | 900 | 900 | 900 | 900 | 900 | 900 | 900 | |
| | Aggregate, quarrying. | 700 | 700 | 700 | 700 | 700 | 700 | 700 | |
| | Cement. | 800 | 800 | 800 | 800 | 800 | 800 | 800 | |
| | Iron and steel. | 1,300 | 1,300 | 1,300 | 1,300 | 1,300 | 1,300 | 1,300 | |
| | Petroleum products. | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| | Coal and coke. | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| | Metallic-ore mining. | 700 | 700 | 700 | 700 | 700 | 700 | 700 | |
| | Forestry products. | 200 | 200 | 200 | 200 | 200 | 200 | 200 | |
| | Advertising and development. | 200 | 200 | 200 | 200 | 200 | 200 | 200 | |
| | Explosives. | 200 | 200 | 200 | 200 | 200 | 200 | 200 | |
| | Laboratory. | 200 | 200 | 200 | 200 | 200 | 200 | 200 | |
| | Rubber. | 200 | 200 | 200 | 200 | 200 | 200 | 200 | |
| | Brick. | 200 | 200 | 200 | 200 | 200 | 200 | 200 | |
| | Agricultural products. | 200 | 200 | 200 | 200 | 200 | 200 | 200 | |
| | Nonferrous-metals refining. | 200 | 200 | 200 | 200 | 200 | 200 | 200 | |
| | Acerrals from distribution 7. | 200 | 200 | 200 | 200 | 200 | 200 | 200 | |
| 7 | | 89,900 | 89,900 | 1,200 | 1,300 | 1,100 | 65,900 | 116,200 | |
| 8 | | 415,100 | 415,100 | 1,200 | 6,500 | 1,200 | 300 | 300 | |

1 Calculated value of business created in subsequent distributions. Details of derivation not shown.

ANALYSIS OF HIGHWAY-CONSTRUCTION EXPENDITURES

TABLE 15.—Reinvestment in consumer goods traced progressively through various industries until ultimately paid as salaries and wages or to interest and margin—Continued

BREAK-DOWN NO. 11-METALLIC-ORE MINING

[Figures in parentheses at heads of columns are percentages, from table 5, applied in making distributions]

Expenditure for forestry products by other industries

BREAK-DOWN NO. 13—ADVERTISING AND DEVELOPMENT

DISTRIBUTION OF EXPENDITURES FOR CONSUMER GOODS

45

| Progressive distribution no. | Source | Amount | Total | Salaries and wages | Interest | Margin | No. 2 transportation | No. 3, plant and equipment | No. 5, insurance and taxes | No. 8, petroleum products | No. 9, coal and coke | No. 10, power | No. 12, forestry products | | |
|------------------------------|------------------------------|----------|----------|--------------------|----------|---------|----------------------|----------------------------|----------------------------|---------------------------|----------------------|---------------|---------------------------|---------|--|
| | | | | | | | | | | | | | | | |
| 2 | Retail trade | \$14,300 | \$14,800 | \$5,500 | \$900 | \$1,200 | (3.46) | \$500 | \$3,800 | \$600 | \$200 | \$100 | \$900 | \$1,100 | |
| | Transportation | 29,300 | | | | | | | | | | | | | |
| | Plant and equipment | 10,000 | | | | | | | | | | | | | |
| | Petroleum products | 500 | | | | | | | | | | | | | |
| | Power | 3,100 | | | | | | | | | | | | | |
| | Wholesale trade | 114,800 | | | | | | | | | | | | | |
| | Transportation | 5,900 | | | | | | | | | | | | | |
| | Plant and equipment | 9,000 | | | | | | | | | | | | | |
| | Aggregate, quarrying | 300 | | | | | | | | | | | | | |
| | Cement | 100 | | | | | | | | | | | | | |
| | Iron and steel | 2,300 | | | | | | | | | | | | | |
| | Petroleum products | 2,200 | | | | | | | | | | | | | |
| | Coal and coke | 3,300 | | | | | | | | | | | | | |
| | Power | 3,400 | | | | | | | | | | | | | |
| | Metallic-ore mining | 3,800 | | | | | | | | | | | | | |
| | Forestry products | 1,900 | | | | | | | | | | | | | |
| | Laboratory | 300 | | | | | | | | | | | | | |
| | Rubber | 300 | | | | | | | | | | | | | |
| | Brick | 300 | | | | | | | | | | | | | |
| | Nonferrous-metals refining | 300 | | | | | | | | | | | | | |
| | Manufacturing | 100 | | | | | | | | | | | | | |
| | Transportation | 44,300 | | | | | | | | | | | | | |
| | Plant and equipment | 4,900 | | | | | | | | | | | | | |
| | Aggregate, quarrying | 18,600 | | | | | | | | | | | | | |
| | Cement | 300 | | | | | | | | | | | | | |
| | Iron and steel | 100 | | | | | | | | | | | | | |
| | Petroleum products | 1,000 | | | | | | | | | | | | | |
| | Coal and coke | 2,800 | | | | | | | | | | | | | |
| | Power | 600 | | | | | | | | | | | | | |
| | Metallic-ore mining | 2,100 | | | | | | | | | | | | | |
| | Forestry products | 5,500 | | | | | | | | | | | | | |
| | Explosives | 1,900 | | | | | | | | | | | | | |
| | Laboratory | 200 | | | | | | | | | | | | | |
| | Brick | 200 | | | | | | | | | | | | | |
| | Nonferrous-metals refining | 300 | | | | | | | | | | | | | |
| | Transportation | 100 | | | | | | | | | | | | | |
| | Plant and equipment | 3,400 | | | | | | | | | | | | | |
| | Aggregate, quarrying | 8,600 | | | | | | | | | | | | | |
| | Cement | 400 | | | | | | | | | | | | | |
| | Iron and steel | 200 | | | | | | | | | | | | | |
| | Petroleum products | 1,600 | | | | | | | | | | | | | |
| | Coal and coke | 800 | | | | | | | | | | | | | |
| | Power | 100 | | | | | | | | | | | | | |
| | Metallic-ore mining | 1,400 | | | | | | | | | | | | | |
| | Forestry products | 19,800 | | | | | | | | | | | | | |
| | Explosives | 700 | | | | | | | | | | | | | |
| | Laboratory | 300 | | | | | | | | | | | | | |
| | Brick | 500 | | | | | | | | | | | | | |
| | Nonferrous-metals refining | 200 | | | | | | | | | | | | | |
| | Transportation | 1,800 | | | | | | | | | | | | | |
| | Plant and equipment | 2,600 | | | | | | | | | | | | | |
| | Aggregate, quarrying | 400 | | | | | | | | | | | | | |
| | Cement | 100 | | | | | | | | | | | | | |
| | Iron and steel | 800 | | | | | | | | | | | | | |
| | Petroleum products | 200 | | | | | | | | | | | | | |
| | Coal and coke | 100 | | | | | | | | | | | | | |
| | Power | 800 | | | | | | | | | | | | | |
| | Metallic-ore mining | 1,100 | | | | | | | | | | | | | |
| | Forestry products | 300 | | | | | | | | | | | | | |
| | Explosives | 100 | | | | | | | | | | | | | |
| | Laboratory | 200 | | | | | | | | | | | | | |
| | Brick | 200 | | | | | | | | | | | | | |
| | Nonferrous-metals refining | 300 | | | | | | | | | | | | | |
| | Accruals from distribution 7 | 120,700 | | | | | | | | | | | | | |
| | Total | 322,100 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

1 Calculated value of business created in subsequent distributions. Details of derivation not shown.

ANALYSIS OF HIGHWAY-CONSTRUCTION EXPENDITURES

TABLE 15.—Reinvestment in consumer goods traced progressively through various industries until ultimately paid as salaries and wages or to interest and margin—Continued

BREAK-DOWN NO. 14—EXPLOSIVES

[Figures in parentheses at heads of columns are percentages, from table 5, applied in making distributions]

BREAK-DOWN NO. 15—LABORATORY

Expenditure for laboratory by other industries

DISTRIBUTION OF EXPENDITURES FOR CONSUMER GOODS

47

| | | | | | | | | | | | | | |
|---------------------------------|-------|--|--|--|--|--|--|--|--|--|--|--|--|
| 1 Transportation | | | | | | | | | | | | | |
| 2 Plant and equipment | 1,700 | | | | | | | | | | | | |
| 3 Aggregate, quarrying | 4,200 | | | | | | | | | | | | |
| 4 Cement | 200 | | | | | | | | | | | | |
| 5 Iron and steel | 1,600 | | | | | | | | | | | | |
| 6 Explosives | 800 | | | | | | | | | | | | |
| 7 Petroleum products | 200 | | | | | | | | | | | | |
| 8 Rubber | 700 | | | | | | | | | | | | |
| 9 Brick | 200 | | | | | | | | | | | | |
| 10 Nonferrous-metals refining | 100 | | | | | | | | | | | | |
| 11 Transportation | 1,000 | | | | | | | | | | | | |
| 12 Plant and equipment | 1,200 | | | | | | | | | | | | |
| 13 Aggregate, quarrying | 100 | | | | | | | | | | | | |
| 14 Cement | 200 | | | | | | | | | | | | |
| 15 Iron and steel | 800 | | | | | | | | | | | | |
| 16 Petroleum products | 200 | | | | | | | | | | | | |
| 17 Rubber | 300 | | | | | | | | | | | | |
| 18 Brick | 100 | | | | | | | | | | | | |
| 19 Accruals from distribution 7 | 1,800 | | | | | | | | | | | | |
| 20 Total | 1,600 | | | | | | | | | | | | |

BREAK-DOWN NO. 16—RUBBER

| Expenditure for rubber by other industries | | | | | | | | | | | | | | | | |
|--|----------|---------|---------|--------------------|----------|---------|-------------------------|----------------------------|----------------------------|----------------------------|---------------------------|----------------------|---------------|-------------------------------------|--------------------|-------------------------------|
| Progressive distribution no. | Source | Amount | Total | Salaries and wages | Interest | Margin | No. 2, trans- portation | No. 3, plant and equipment | No. 4, aggregate quarrying | No. 5, insurance and taxes | No. 8, petroleum products | No. 9, coal and coke | No. 10, power | No. 13, advertising and development | No. 15, laboratory | No. 18, agricultural products |
| 3 Plant and equipment | \$27,100 | (21.09) | (2.09) | \$27,100 | \$600 | \$1,200 | \$3,100 | \$700 | \$300 | \$300 | \$300 | \$300 | \$300 | \$400 | \$12,700 | |
| 4 Plant and equipment | 24,500 | | | 24,500 | 5,200 | 1,400 | 2,800 | 600 | 100 | 500 | 400 | 400 | 400 | 400 | 400 | 11,500 |
| 5 Plant and equipment | 50,400 | | | 50,400 | 10,600 | 2,900 | 2,200 | 5,700 | 1,300 | 1,100 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 23,700 |
| 6 Plant and equipment | 23,200 | | | 23,200 | 4,900 | 500 | 1,300 | 2,700 | 600 | 600 | 300 | 300 | 300 | 300 | 300 | 10,900 |
| 7 Plant and equipment | 6,700 | | | 6,700 | 1,400 | 100 | 400 | 300 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 3,200 |
| 8 Accruals from distribution 7 | 3,400 | | | 3,400 | 2,500 | 200 | 700 | 200 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | |
| Total | | | 143,700 | 30,300 | 3,000 | 8,200 | 41,500 | | | | | | | | | |

BREAK-DOWN NO. 17—BRICK

| Expenditures for brick by other industries | | | | | | | | | | | | | | | |
|--|---------|---------|--------|--------------------|----------|---------|-------------------------|----------------------------|----------------------------|---------------------------|----------------------|---------------|-------------------------------------|--------------------|-------|
| Progressive distribution no. | Source | Amount | Total | Salaries and wages | Interest | Margin | No. 2, transpor- tation | No. 3, plant and equipment | No. 5, insurance and taxes | No. 8, petroleum products | No. 9, coal and coke | No. 10, power | No. 13, advertising and development | No. 15, laboratory | |
| 3 Transportation | \$3,000 | (46.52) | (3.29) | \$3,000 | \$5,400 | \$1,700 | \$800 | \$1,300 | \$500 | \$400 | \$400 | \$300 | \$300 | \$300 | \$100 |
| 4 Plant and equipment | 8,700 | | | 8,700 | 8,400 | 3,900 | 300 | 1,200 | 600 | 800 | 400 | 300 | 300 | 300 | 100 |
| 5 Transportation | 7,800 | | | 7,800 | 500 | 16,700 | 7,800 | 600 | 2,400 | 1,100 | 1,600 | 800 | 600 | 600 | 200 |
| 6 Plant and equipment | 16,200 | | | 16,200 | 400 | 7,400 | 3,600 | 300 | 1,100 | 500 | 800 | 300 | 300 | 300 | 200 |
| 7 Transportation | 2,200 | | | 2,200 | 2,400 | 1,100 | 400 | 200 | 200 | 100 | 100 | 100 | 100 | 100 | 100 |
| 8 Accruals from distribution 7 | 1,700 | | | 1,700 | 1,900 | 900 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | |
| Total | | | 48,900 | 22,700 | 22,700 | 1,600 | 31,400 | 31,400 | 7,100 | 7,100 | 7,100 | 7,100 | 7,100 | 7,100 | |

¹ Calculated value of business created in subsequent distributions. Details of derivation not shown.

ANALYSIS OF HIGHWAY-CONSTRUCTION EXPENDITURES

TABLE 15.—Reinvestment in consumer goods traced progressively through various industries until ultimately paid as salaries and wages or to interest and margin—Continued

BREAK-DOWN NO. 18—AGRICULTURAL PRODUCTS

[Figures in parentheses at heads of columns are percentages, from table 5, applied in making distributions]

| Progressive distribution no. | Expenditure for agricultural products by other industries | | | | Distribution to— | | | |
|--------------------------------|---|-----------|---------|--------------------|------------------|----------|-----------------------|----------------------------|
| | Source | Amount | Total | Salaries and wages | Interest | Margin | No. 2, transportation | No. 3, plant and equipment |
| 3 Wholesale trade | | \$592,100 | (24,23) | \$13,500 | (13.68) | (11.88) | (3.00) | (32.80) |
| 4 Rubber | | 12,700 | | \$81,000 | \$70,300 | \$17,800 | \$194,200 | \$50,200 |
| 5 Container manufacturing | | 100 | | 93,000 | 80,700 | 20,400 | 222,900 | 57,600 |
| 6 Rubber | | 666,800 | | | | | | |
| 7 Container | | 11,600 | | | | | | |
| 8 Accruals from distribution 7 | | 300 | | | | | | |
| Total | | 1,325,100 | | 321,000 | 181,300 | 659,800 | 157,500 | |

BREAK-DOWN NO. 20—NONFERROUS-METALS REFINING

| Progressive distribution no. | Expenditure for nonferrous-metals refining by other industries | | | | Distribution to— | | | |
|--------------------------------|--|----------|---------|--------------------|------------------|--------|-----------------------|----------------------------|
| | Source | Amount | Total | Salaries and wages | Interest | Margin | No. 2, transportation | No. 3, plant and equipment |
| 3 Transportation | | \$13,500 | \$1,200 | (9.19) | (1.22) | (4.35) | (10.80) | (5.34) |
| 4 Plant and equipment | | 8,400 | | \$600 | \$200 | 800 | \$1,500 | \$700 |
| 5 Iron and steel | | 1,000 | | | | | | |
| 6 Laboratory | | 7,600 | | | | | | |
| 7 Transportation | | 9,300 | | | | | | |
| 8 Accruals from distribution 7 | | 4,100 | | | | | | |
| Total | | 116,000 | 21,600 | 2,000 | 300 | 800 | 2,300 | 1,200 |

| Progressive distribution no. | Expenditure for nonferrous-metals refining by other industries | | | | Distribution to— | | | |
|--------------------------------|--|---------|---------|--------------------|------------------|--------|-----------------------|----------------------------|
| | Source | Amount | Total | Salaries and wages | Interest | Margin | No. 2, transportation | No. 3, plant and equipment |
| 3 Transportation | | \$5,100 | \$1,200 | (9.19) | (1.22) | (4.35) | (10.80) | (5.34) |
| 4 Plant and equipment | | 8,400 | | \$600 | \$200 | 800 | \$1,500 | \$700 |
| 5 Iron and steel | | 1,000 | | | | | | |
| 6 Laboratory | | 7,600 | | | | | | |
| 7 Transportation | | 9,300 | | | | | | |
| 8 Accruals from distribution 7 | | 4,100 | | | | | | |
| Total | | 116,000 | 17,600 | 2,600 | 1,600 | 200 | 8,700 | 1,200 |

DISTRIBUTION OF EXPENDITURES FOR CONSUMER GOODS

| Progressive distribution no. | Expenditure for container by other industries | | | | | Distribution to— | | | | | | | | | | | |
|------------------------------|---|--------|---------|--------------------|----------|------------------|-----------------------|----------------------------|----------------------------|-----------------------|---------------------------|----------------------|---------------|---------------------------|-------------------------------------|-------------------------------|------------------------------------|
| | Source | Amount | Total | Salaries and wages | Interest | Margin | No. 2, transportation | No. 3, plant and equipment | No. 5, insurance and taxes | No. 7, iron and steel | No. 8, petroleum products | No. 9, coal and coke | No. 10, power | No. 12, forestry products | No. 13, advertising and development | No. 18, agricultural products | No. 20, nonferrous metals refining |
| 3 Petroleum products | \$500 | \$500 | (21.07) | (1.83) | (6.80) | (4.53) | (6.86) | (3.22) | (28.03) | \$200 | \$100 | (0.18) | (0.14) | (0.83) | (14.65) | (0.43) | (10.91) |
| 4 Cement | 100 | 2,500 | 500 | | | | \$200 | \$100 | \$100 | 700 | | | | \$100 | | \$100 | |
| 5 Petroleum products | 100 | 3,700 | 800 | \$100 | 300 | 200 | 300 | 100 | 1,000 | | | | | 400 | | 300 | |
| 6 Explosives | 400 | 1,500 | 300 | | | | 100 | 100 | 100 | 400 | | | | 500 | | 400 | |
| 7 Cement | 900 | 500 | 300 | 100 | 200 | 200 | | | | | | | | 200 | | 200 | |
| 8 Explosives | 200 | 100 | 200 | | | | | | | | | | | 100 | | 100 | |
| Total | | | | | | | 2,000 | 100 | 600 | | | | | | | | |
| | | | | | | | 2,700 | | | | | | | | | | |

¹ Calculated value of business created in subsequent distributions. Details of derivation not shown.

TABLE 16.—Summary of steps in the distribution of consumer-goods expenditures, from reinvestment

| Break-down no. | Expense item or industry | Consumer expenditure | Progressive distribution no.— | | | | | | | |
|--------------------------------|--------------------------|----------------------|-------------------------------|-------------|-------------|-------------|------------|-------------|-------------|-------------|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 Salaries and wages | \$1,630,000 | \$3,182,500 | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent | Per cent |
| 2 Interest | 14.28 | 46.00 | \$5,250,300 | \$5,182,500 | \$5,179,200 | \$6,379,200 | \$6,355,89 | \$6,383,300 | \$7,107,100 | \$7,210,500 |
| 3 Margin | 133,500 | 1,329,500 | 424,800 | 372 | 8,33 | 1,179,200 | 10,33 | 1,255,500 | 60,30 | 62,26 |
| 4 Transportation | 603,800 | 5,29 | 1,644,700 | 1,41 | 2,155,500 | 2,531,900 | 22,18 | 2,685,800 | 11,00 | 11,29 |
| 5 Plant and equipment | 1,349,200 | 11.82 | 270,500 | 2.39 | 225,600 | 1.98 | 158,700 | 1.39 | 130,300 | 1.76 |
| 6 Aggregate, quarrying | 526,200 | 4.61 | 474,700 | 4.16 | 978,600 | 3.88 | 449,800 | 3.94 | 12,500 | 65,100 |
| 7 Insurance and taxes | 143,800 | 1.26 | 10,900 | .08 | 10,900 | .10 | 14,700 | .13 | 159,800 | .11 |
| 8 Cement | | | | | | | | | 1,400 | 57,200 |
| 9 Iron and steel | | | | | | | | | 6,300 | 26,300 |
| 10 Petroleum products | | | | | | | | | 12,500 | 23,500 |
| 11 Coal and coke | | | | | | | | | 1,000 | 1,000 |
| 12 Power | | | | | | | | | 1,000 | 1,000 |
| 13 Metallic-ore mining | | | | | | | | | 1,000 | 1,000 |
| 14 Forestry products | | | | | | | | | 1,000 | 1,000 |
| 15 Advertising and development | | | | | | | | | 1,000 | 1,000 |
| 16 Explosives | | | | | | | | | 1,000 | 1,000 |
| 17 Laboratory | | | | | | | | | 1,000 | 1,000 |
| 18 Rubber | | | | | | | | | 1,000 | 1,000 |
| 19 Brick | | | | | | | | | 1,000 | 1,000 |
| 20 Agricultural products | | | | | | | | | 1,000 | 1,000 |
| 21 Nonferrous-metals refining | | | | | | | | | 1,000 | 1,000 |
| 22 Container | | | | | | | | | 1,000 | 1,000 |
| 23 Retail trade | | | | | | | | | 1,000 | 1,000 |
| 24 Wholesale trade | | | | | | | | | 1,000 | 1,000 |
| Total | 11,414,400 | 100,00 | 11,414,400 | 100,00 | 11,414,400 | 100,00 | 11,414,400 | 100,00 | 11,414,400 | 100,00 |
| Grand total | 11,414,400 | 100,00 | 11,414,400 | 100,00 | 11,414,400 | 100,00 | 11,414,400 | 100,00 | 11,414,400 | 100,00 |

Table 17 shows by industries the total value of business transacted as a result of the expenditures for consumer goods and, from that total business in each industry, the payments made to salaries and wages, to interest, and to margin, together with the total of these three items. This total for all industries is that of the original consumer-goods expenditure, the distribution of which entailed the transaction of business valued at \$32,109,300. These data are sufficient for the resumption of the analysis of the distribution of expenditures by reinvestment.

TABLE 17.—*Recapitulation of consumer-expenditures distribution from reinvestment*

| Industry | Salaries and wages | Interest | Margin | Total | Value of business |
|----------------------|--------------------|----------|-----------|-------------|-------------------|
| Transportation | \$1,115,000 | \$89,600 | \$309,600 | \$1,514,200 | \$2,154,300 |
| Plant and equipment | 1,078,100 | 126,600 | 439,600 | 1,644,300 | 2,674,700 |
| Aggregate, quarrying | 23,900 | 1,400 | 3,100 | 28,400 | 57,100 |
| Insurance and taxes | 487,800 | 134,900 | — | 622,700 | 1,037,700 |

TABLE 17.—*Recapitulation of consumer-expenditures distribution from reinvestment—Continued*

| Industry | Salaries and wages | Interest | Margin | Total | Value of business |
|-----------------------------|--------------------|-----------|-----------|------------|-------------------|
| Cement | \$10,200 | \$2,500 | \$3,000 | \$15,700 | \$40,800 |
| Iron and steel | 136,000 | 15,900 | 39,900 | 191,800 | 599,200 |
| Petroleum products | 106,600 | 19,600 | 46,700 | 172,900 | 357,600 |
| Coal and coke | 137,800 | 11,600 | 13,700 | 163,100 | 224,500 |
| Power | 89,900 | 65,900 | 116,200 | 272,000 | 415,100 |
| Metallic-ore mining | 162,000 | 14,400 | 50,600 | 227,000 | 451,500 |
| Forestry products | 146,600 | 8,600 | 28,000 | 183,200 | 276,600 |
| Advertising and development | 120,700 | 18,900 | 25,700 | 165,300 | 322,100 |
| Explosives | 13,400 | 3,300 | 8,500 | 25,200 | 65,500 |
| Laboratory | 24,400 | 3,000 | 7,300 | 34,700 | 66,200 |
| Rubber | 30,300 | 3,000 | 8,200 | 41,500 | 143,700 |
| Brick | 22,700 | 1,600 | 7,100 | 31,400 | 48,900 |
| Agricultural products | 321,000 | 181,300 | 157,500 | 659,800 | 1,325,100 |
| Nonferrous-metals refining | 8,700 | 1,200 | 4,000 | 13,900 | 94,300 |
| Container | 2,000 | 100 | 600 | 2,700 | 8,700 |
| Retail trade | 1,630,000 | 133,500 | 603,800 | 2,367,300 | 11,414,400 |
| Wholesale trade | 535,800 | 170,400 | 722,700 | 1,428,900 | 6,869,200 |
| Manufacturing | 1,090,900 | 308,100 | 209,400 | 1,608,400 | 3,462,100 |
| Total | 7,293,800 | 1,315,400 | 2,805,200 | 11,414,400 | 32,109,300 |

REINVESTMENT OF INTEREST AND MARGIN

In this analysis margin goes to dividends and surplus; dividends and interest combine and go to large and small incomes; surplus and large incomes combine and are used for the manufacture of producer goods; and small incomes are expended for consumer goods. Expenditures for producer goods are distributed in accordance with the percentage distribution developed in table 12, and expenditures for consumer goods are distributed according to percentages developed in

table 15. In both distributions accruals to salaries and wages are set aside. The items of interest and margin which reappear are redistributed in progressive steps. Finally, only salaries and wages remain from reinvestment. These are divided in the amounts of \$14,827,600 for producer goods and \$10,446,400 for consumer goods. The complete development of these amounts is shown in the successive distributions made in table 18.

TABLE 18.—*Reinvested interest and margin traced to ultimate payment as salaries and wages*

DIVIDENDS AND SURPLUS

[Figures in parentheses at heads of columns are percentages applied in making distributions]

| Progressive distribution no. | Expenditures accruing to dividends and surplus | | | Distribution to— | |
|------------------------------|--|--------------|-----------|------------------|-------------|
| | Source | Amount | Total | Dividends | Surplus |
| | | | | (59.82) | (40.18) |
| 1 Margin, reinvestment | 1 \$17,196,400 | \$17,196,400 | | | |
| 4 Margin, producer goods | 2,383,400 | | 5,188,600 | \$10,286,600 | \$6,909,800 |
| 4 Margin, consumer goods | 2,305,200 | | | 3,103,800 | 2,084,800 |
| 7 Margin, producer goods | 718,900 | | | | |
| 7 Margin, consumer goods | 846,100 | | 1,565,000 | 936,200 | 628,800 |
| 10 Margin, producer goods | 216,800 | | | | |
| 10 Margin, consumer goods | 255,300 | | 472,100 | 282,400 | 189,700 |
| 13 Margin, producer goods | 65,400 | | | | |
| 13 Margin, consumer goods | 77,000 | | 142,400 | 85,200 | 57,200 |
| 16 Margin, producer goods | 19,700 | | | | |
| 16 Margin, consumer goods | 23,200 | | 42,900 | 25,700 | 17,200 |

LARGE AND SMALL INCOMES

| Progressive distribution no. | Expenditures accruing to large and small incomes | | | Distribution to— | |
|------------------------------|--|--------------|-----------|------------------|---------------|
| | Source | Amount | Total | Large incomes | Small incomes |
| | | | | (37.84) | (62.16) |
| 1 Interest, reinvestment | 1 \$8,077,600 | \$18,364,200 | | | |
| 2 Dividends | 10,286,600 | | | \$6,949,800 | \$11,414,400 |
| 4 Interest, producer goods | 1,119,500 | | | | |
| 4 Interest, consumer goods | 1,315,400 | | 5,538,700 | 2,095,800 | 3,442,900 |
| 5 Dividends | 3,103,800 | | | | |
| 7 Interest, producer goods | 337,700 | | | | |
| 7 Interest, consumer goods | 396,800 | | 1,670,700 | 632,200 | 1,038,500 |
| 8 Dividends | 936,200 | | | | |
| 10 Interest, producer goods | 101,900 | | | | |
| 10 Interest, consumer goods | 119,600 | | 503,900 | 190,700 | 313,200 |
| 11 Dividends | 282,400 | | | | |
| 13 Interest, producer goods | 30,700 | | | | |
| 13 Interest, consumer goods | 36,100 | | 152,000 | 57,500 | 94,500 |
| 14 Dividends | 85,200 | | | | |
| 16 Interest, producer goods | 9,300 | | | | |
| 16 Interest, consumer goods | 10,900 | | 45,900 | 17,400 | 28,500 |
| 17 Dividends | 25,700 | | | | |

¹ From table 14.

TABLE 18.—*Reinvested interest and margin traced to ultimate payment as salaries and wages—Continued*
PRODUCER GOODS

[Figures in parentheses at head of columns are percentages applied in making distributions]

| Progressive distribution no. | Expenditures accruing to producer goods by reinvestment | | | Distribution to— | | |
|------------------------------------|---|-------------|--------------|--------------------|-------------|-------------|
| | Source | Amount | Total | Salaries and wages | Interest | Margin |
| 2 Surplus | | | | (74.72) | (8.08) | (17.20) |
| 3 Large incomes | | \$6,909,800 | \$13,859,600 | \$10,356,700 | \$1,119,500 | \$2,383,400 |
| 5 Surplus | | 6,949,800 | | | | |
| 6 Large incomes | | 2,084,800 | 4,180,600 | 3,124,000 | 337,700 | 718,900 |
| 8 Surplus | | 2,095,800 | | | | |
| 9 Large incomes | | 628,800 | | | | |
| 11 Surplus | | 632,200 | 1,261,000 | 942,300 | 101,900 | 216,800 |
| 12 Large incomes | | 189,700 | | | | |
| 14 Surplus | | 190,700 | 380,400 | 284,300 | 30,700 | 65,400 |
| 15 Large incomes | | 57,200 | | | | |
| 17 Surplus | | 57,500 | 114,700 | 85,700 | 9,300 | 19,700 |
| 18 {Large incomes | | 17,200 | | | | |
| {Subsequent distribution | | 17,400 | 46,300 | 34,600 | | |
| | | 2 11,700 | | | | |
| Total, producer-goods reinvestment | | | | 14,827,600 | | |

CONSUMER GOODS

| Progressive distribution no. | Expenditures accruing to consumer goods by reinvestment | | | Distribution to— | | |
|------------------------------------|---|--------------|--------------|--------------------|-------------|-------------|
| | Source | Amount | Total | Salaries and wages | Interest | Margin |
| 3 Small incomes | | | | (63.90) | (11.52) | (24.58) |
| 6 do | | \$11,414,400 | \$11,414,400 | \$7,293,800 | \$1,315,400 | \$2,805,200 |
| 9 do | | 3,442,900 | | 2,200,000 | 396,800 | 846,100 |
| 12 do | | 1,038,500 | 1,038,500 | 663,600 | 119,600 | 255,300 |
| 15 do | | 313,200 | | 200,100 | 36,100 | 77,000 |
| 18 {do | | 94,500 | | 60,400 | 10,900 | 23,200 |
| {Subsequent distribution | | 28,500 | | | | |
| | | 2 16,100 | 44,600 | 28,500 | | |
| Total, consumer-goods reinvestment | | | | 10,446,400 | | |

* Sum of accruals from subsequent distributions. Details of derivation not shown.

Table 19 is a summary of the results obtained in tracing the effect of the expenditure of \$100,000,000 for highways until payments are ultimately made to salaries and wages. Direct labor on highway construction work receives \$24,391,000. Indirect labor, resulting from the investment of funds in materials and equipment for highway construction, receives a total of \$50,335,000, as shown in the third column of table 19. From reinvestment in the fields of producer and consumer goods labor receives a further share in the amount of \$25,274,000.

TABLE 19.—*Ultimate distribution to salaries and wages of \$100,000,000 highway construction expenditure*

| Industry | To salaries and wages through— | | | | |
|-----------------------------|--------------------------------|------------------------------|--------------------------------|--------------------------------|--------------|
| | Direct | Investment in producer goods | Reinvestment in producer goods | Reinvestment in consumer goods | Total |
| Highway construction | \$24,391,000 | | | | \$24,391,000 |
| Transportation | | \$13,489,600 | \$3,973,700 | \$1,596,900 | 19,060,200 |
| Plant and equipment | | 11,169,000 | 3,290,100 | 1,544,100 | 16,003,200 |
| Aggregate, quarrying | | 5,538,000 | 1,631,400 | 34,200 | 7,203,600 |
| Insurance and taxes | | 4,486,500 | 1,321,700 | 698,600 | 6,506,800 |
| Cement | | 3,681,000 | 1,084,400 | 14,600 | 4,780,000 |
| Iron and steel | | 2,707,100 | 797,500 | 194,800 | 3,699,400 |
| Petroleum products | | 1,852,200 | 545,600 | 152,700 | 2,550,500 |
| Coal and coke | | 1,821,000 | 536,400 | 197,400 | 2,554,800 |
| Power | | 534,900 | 157,600 | 128,800 | 821,300 |
| Metallic-ore mining | | 1,030,200 | 303,500 | 232,000 | 1,565,700 |
| Forestry products | | 1,067,300 | 314,400 | 210,000 | 1,591,700 |
| Advertising and development | | 831,400 | 244,900 | 172,900 | 1,249,200 |

TABLE 19.—*Ultimate distribution to salaries and wages of \$100,000,000 highway construction expenditure—Continued*

| Industry | To salaries and wages through— | | | | | |
|----------------------------|--------------------------------|------------------------------|--------------------------------|--------------------------------|------------|-------------|
| | Direct | Investment in producer goods | Reinvestment in producer goods | Reinvestment in consumer goods | Total | |
| Explosives | | | \$465,600 | \$137,200 | \$19,200 | \$622,000 |
| Laboratory | | | 567,200 | 167,100 | 34,900 | 769,200 |
| Rubber | | | 314,500 | 92,600 | 43,400 | 450,500 |
| Brick | | | 283,800 | 83,600 | 32,500 | 399,900 |
| Agricultural products | | | 172,600 | 50,800 | 459,700 | 683,100 |
| Pipe | | | 135,200 | 39,800 | | 175,000 |
| Nonferrous-metals refining | | | 122,300 | 36,000 | 12,500 | 170,800 |
| Container | | | 65,600 | 19,300 | 2,900 | 87,800 |
| Retail trade | | | | | 2,334,500 | 2,334,500 |
| Wholesale trade | | | | | 767,400 | 767,400 |
| Manufacturing | | | | | 1,562,400 | 1,562,400 |
| Total | \$24,391,000 | | 50,335,000 | 14,827,600 | 10,446,400 | 100,000,000 |

The \$14,827,600 accrual to salaries and wages through reinvestment in producer goods is distributed to industries in accordance with the percentages developed for salaries and wages in table 12, and the \$10,446,400 accrual to salaries and wages through reinvestment in consumer goods is distributed to industries according to percentages developed for salaries and wages in table 15. Table 19 therefore shows the total payment to labor in each of the industries involved in highway construction.

EMPLOYMENT CREATED BY HIGHWAY EXPENDITURES

Figure 4 shows the direct employment resulting from the payment of \$24,391,000 to labor on highway work. The scale of wages and hours of work in the several industry groups must be known to establish the relative employment in indirect highway activities where labor is found to receive \$75,609,000, the balance of the original expenditure. Data on wages and hours of work were obtained from records of the Bureau of the Census (25), the Bureau of Labor Statistics (33, 35),

and from other sources. These data were adjusted to conform to recent regulatory legislation, with special reference to particular industries. The rates established for various industries and the results of the analysis based on these rates are shown in table 20. Both the direct and indirect employment is thus determined on the basis of present conditions, giving full recognition to changes which have occurred in industry.

TABLE 20.—*Employment resulting from an annual highway construction expenditure of \$100,000,000*

| Industry | Salaries and wages | Rate per hour | Man-hours | Hours per week | Rate per week | Man-weeks | Rate per month | Man-months | Rate per year | Man-years |
|---------------------------------------|--------------------|---------------|----------------------|----------------|---------------|---------------------|----------------|-------------------|---------------|------------------|
| | \$24,391,000 | \$0.48 | Number 50,870,000 | Number 25.8 | \$12.36 | Number 1,973,900 | \$54 | Number 455,500 | \$640 | Number 37,960 |
| Direct labor | | | | | | | | | | |
| Indirect labor: | | | | | | | | | | |
| Transportation | 19,060,200 | .64 | 29,877,000 | 44.1 | 28.14 | 677,300 | 122 | 156,300 | 1,460 | 13,030 |
| Plant and equipment | 16,003,200 | .62 | 25,647,000 | 37.0 | 23.07 | 693,700 | 100 | 160,100 | 1,200 | 13,340 |
| Aggregate, quarrying | 7,203,600 | .48 | 14,976,000 | 32.7 | 15.73 | 458,000 | 68 | 105,700 | 820 | 8,810 |
| Insurance and taxes | 6,506,800 | .86 | 7,531,000 | 39.3 | 34.00 | 191,400 | 147 | 44,200 | 1,770 | 3,680 |
| Cement | 4,780,000 | .57 | 8,430,000 | 33.2 | 18.80 | 254,200 | 81 | 58,700 | 980 | 4,890 |
| Iron and steel | 3,699,400 | .61 | 6,093,000 | 33.9 | 20.59 | 179,700 | 89 | 41,400 | 1,070 | 3,450 |
| Petroleum products | 2,550,500 | .72 | 3,567,000 | 38.1 | 27.26 | 93,600 | 118 | 21,600 | 1,420 | 1,800 |
| Coal and coke | 2,554,800 | .60 | 4,265,000 | 30.3 | 18.13 | 140,900 | 79 | 32,500 | 940 | 2,710 |
| Power | 821,300 | .72 | 1,136,000 | 42.5 | 30.73 | 26,700 | 132 | 6,200 | 1,600 | 510 |
| Metallic-ore mining | 1,565,700 | .57 | 2,756,000 | 39.5 | 22.42 | 69,800 | 97 | 16,100 | 1,170 | 1,340 |
| Forestry products | 1,591,700 | .44 | 3,618,000 | 32.5 | 14.28 | 111,500 | 62 | 25,700 | 740 | 2,140 |
| Advertising and development | 1,249,200 | .84 | 1,494,000 | 39.4 | 33.00 | 37,900 | 143 | 8,700 | 1,720 | 730 |
| Explosives | 622,000 | .68 | 917,000 | 34.3 | 23.24 | 26,800 | 101 | 6,200 | 1,210 | 510 |
| Laboratory | 769,200 | .61 | 1,261,000 | 40.7 | 24.83 | 31,000 | 108 | 7,200 | 1,290 | 600 |
| Rubber | 450,500 | .73 | 613,000 | 30.2 | 22.15 | 20,300 | 96 | 4,700 | 1,150 | 390 |
| Brick | 399,900 | .43 | 921,000 | 31.6 | 13.72 | 29,100 | 59 | 6,700 | 710 | 560 |
| Agricultural products | 683,100 | .12 | 5,509,000 | 72.3 | 8.96 | 76,200 | 39 | 17,600 | 470 | 1,470 |
| Pipe | 175,000 | .61 | 289,000 | 34.4 | 20.88 | 8,400 | 91 | 1,900 | 1,090 | 160 |
| Nonferrous-metals refining | 170,800 | .53 | 319,000 | 37.1 | 19.94 | 8,600 | 86 | 2,000 | 1,040 | 170 |
| Container | 87,800 | .50 | 176,000 | 34.5 | 17.34 | 5,100 | 75 | 1,200 | 900 | 100 |
| Retail trade | 2,334,500 | .51 | 4,595,000 | 39.4 | 20.03 | 116,600 | 87 | 26,900 | 1,040 | 2,240 |
| Wholesale trade | 767,400 | .64 | 1,203,000 | 41.3 | 26.38 | 29,100 | 114 | 6,700 | 1,370 | 560 |
| Manufacturing | 1,562,400 | .55 | 2,841,000 | 35.5 | 19.51 | 80,100 | 84 | 18,500 | 1,010 | 1,540 |
| Total or average | 75,609,000 | .59 | 128,034,000 | 38.0 | 22.46 | 3,366,000 | 97 | 776,800 | 1,170 | 64,730 |
| Grand total or average | 100,000,000 | .56 | 178,904,000 | 33.5 | 18.73 | 5,339,900 | 81 | 1,232,300 | 970 | 102,690 |
| Ratio, direct labor to indirect labor | 1:3.10 | 1:1.23 | 1:2.52 | 1:1.47 | 1:1.82 | 1:1.70 | 1:1.82 | 1:1.70 | 1:1.82 | 1:1.70 |

The data of table 20 in terms of man-hours, man-weeks, man-months, and man-years, together with wage rates and employment ratios, clearly show the employment developed. For each person employed directly on the job, 1.7 persons are employed indirectly in industries furnishing materials, equipment, and supplies, and in servicing these industries.

In the past, direct labor for highway construction has been drawn largely from rural sources and indirect labor largely from urban areas. Obviously, some of the direct workers normally reside in cities and others of the indirect class are employed in operations which require rural residence. Recently, with the requirement that 25 percent of Federal funds for highway construction be assigned to urban areas, the direct employment in cities tends to offset the indirect rural employment. In consideration of this relation, it may be stated that for each highway worker employed in rural areas, approximately 2.6 workers are employed in urban areas.

Statistics on urban and rural unemployment show that they occur in approximately the same ratio as that between urban and rural employment resulting from highway construction. Table 21 shows estimated urban and rural unemployment and ratios between them. These data are based on the 1930 census of the Department of Commerce (22), estimates

of the American Federation of Labor (4), estimates of the National Industrial Conference Board (12), and data from the Bureau of Labor Statistics on trends of employment to 1930 (33). The results establish with reasonable accuracy the number of unemployed and the ratios of rural to urban unemployment.

The data of table 21 are averages for the entire United States. Regional and seasonal variations cause considerable departure from these averages. Urban and rural employment resulting from highway work are also subject to variations with different types of highway construction, with seasons, and with regions. Highway construction, therefore, offers the possibility of adjusting employment to rural and urban needs.

TABLE 21.—*Estimated unemployment in the United States, 1930-34*

| | Persons unemployed | Rural | Ratio of rural to urban unemployment |
|-------------------|---------------------|-----------------|--------------------------------------|
| 1930 | Number 3,188,000 | Percent 31.8 | 1:2.14 |
| 1931 | 6,800,000 | 28.2 | 1:2.54 |
| 1932 | 10,826,000 | 25.1 | 1:2.98 |
| 1933 | 14,960,000 | 23.5 | 1:3.25 |
| 1934 ¹ | 8,100,000 | 27.1 | 1:2.69 |

¹ Estimates incomplete.

VALUE OF BUSINESS RESULTING FROM \$100,000,000 HIGHWAY EXPENDITURE

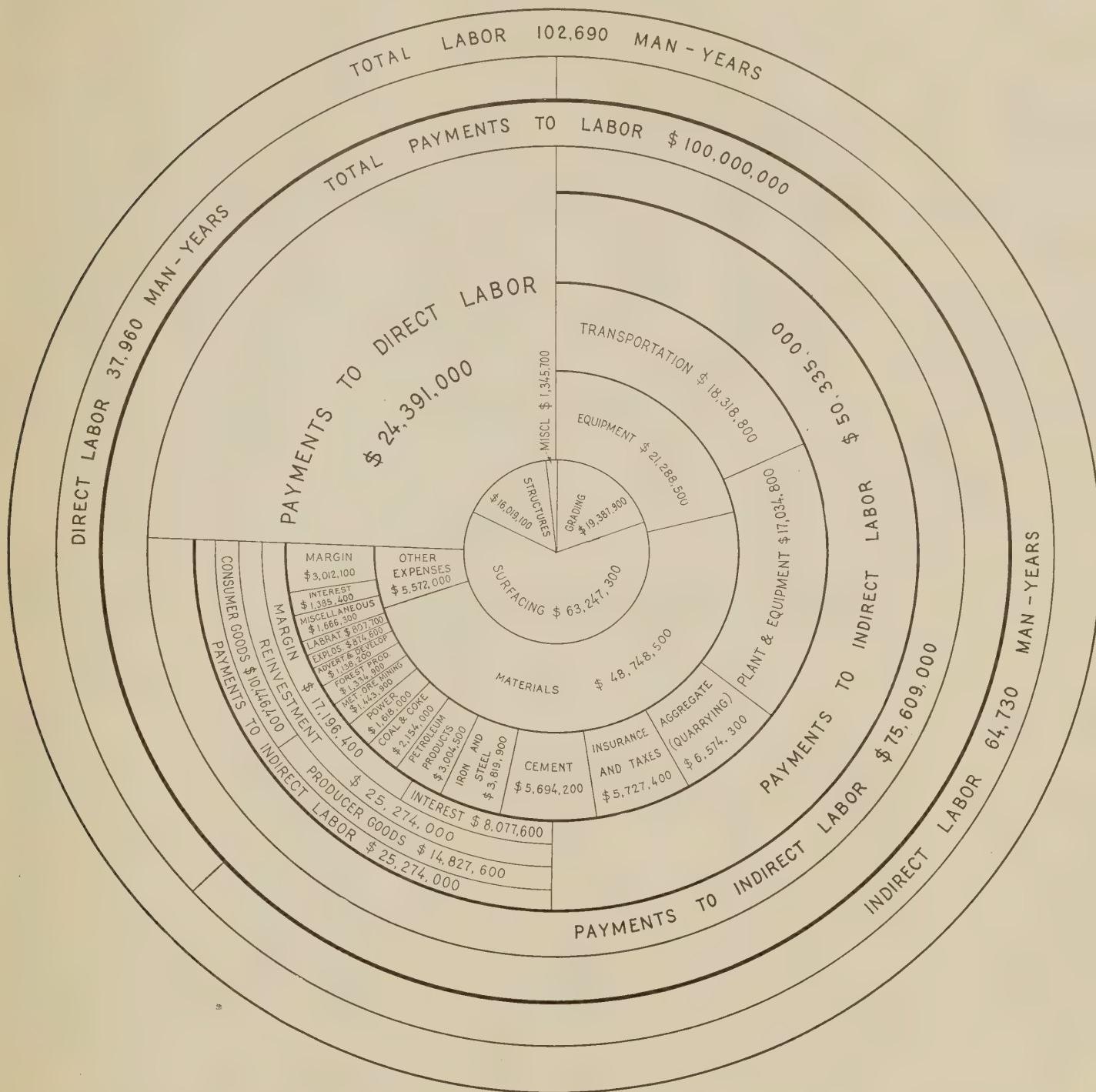


FIGURE 9.—Distribution of \$100,000,000 highway construction expenditure until ultimately paid to labor.

Figure 9 shows graphically the distribution of an expenditure of \$100,000,000 for highways and the steps through which it passes in ultimately reaching labor and causing 102,690 man-years of employment. The value of business transacted is a further measure of the effect of highway expenditures. During the progressive distribution of highway expenditure to all the major industries in the fields of producer goods and consumer goods, record was kept of the total amounts which successively passed through each of the indus-

tries in developing the labor payments shown in table 19. Table 22 shows this value of business by industries. Value of business in the field of reinvestment is assumed to be in direct proportion to the value developed in the distribution of expenditures for producer and consumer goods. These data show that \$100,000,000 spent for the construction of highways in a continuing program sets in motion forces which eventually result in the transaction of business valued at \$315,602,700.

TABLE 22.—Value of business resulting from an expenditure of \$100,000,000 for highway construction

| Industry | Value of business created by— | | | | |
|-----------------------------|-------------------------------|---------------------------|-----------------------------|-----------------------------|---------------|
| | Original expenditure | Producer-goods investment | Producer-goods reinvestment | Consumer-goods reinvestment | Total |
| Highway construction | \$100,000,000 | | | | \$100,000,000 |
| Transportation | \$26,061,800 | \$7,677,200 | \$3,085,500 | 36,824,500 | |
| Plant and equipment | 27,707,600 | 8,162,100 | 3,830,500 | 39,700,500 | |
| Aggregate, quarrying | 13,267,600 | 3,908,300 | 81,800 | 17,257,700 | |
| Insurance and taxes | 9,545,700 | 2,812,000 | 1,486,200 | 13,843,900 | |
| Cement | 14,759,900 | 4,347,900 | 58,400 | 19,166,200 | |
| Iron and steel | 11,941,600 | 3,517,700 | 858,200 | 16,317,500 | |
| Petroleum products | 6,215,000 | 1,830,800 | 512,200 | 8,558,000 | |
| Coal and coke | 2,965,000 | 873,400 | 321,500 | 4,159,900 | |
| Power | 2,470,900 | 727,900 | 594,500 | 3,793,300 | |
| Metallic-ore mining | 2,872,000 | 846,000 | 646,700 | 4,364,700 | |
| Forestry products | 2,014,200 | 593,300 | 396,200 | 3,003,700 | |
| Advertising and development | 2,218,500 | 653,500 | 461,300 | 3,333,300 | |
| Explosives | 2,265,200 | 667,300 | 93,800 | 3,026,300 | |
| Laboratory | 1,531,900 | 451,300 | 94,800 | 2,078,000 | |
| Rubber | 1,491,500 | 439,400 | 205,800 | 2,136,700 | |
| Brick | 610,100 | 179,700 | 70,000 | 859,800 | |
| Agricultural products | 712,200 | 209,800 | 1,897,800 | 2,819,800 | |
| Pipe | 727,500 | 214,300 | — | 941,800 | |
| Nonferrous-metals refining | 1,330,400 | 391,900 | 135,100 | 1,857,400 | |
| Container | 310,800 | 91,600 | 12,500 | 414,900 | |
| Retail trade | — | — | 16,348,000 | 16,348,000 | |
| Wholesale trade | — | — | 9,838,300 | 9,838,300 | |
| Manufacturing | — | — | 4,958,500 | 4,958,500 | |
| Total | 100,000,000 | 31,019,400 | 38,595,400 | 45,987,900 | 315,602,700 |

In further amplification of the total value of business transacted, it may be stated that the \$24,391,000 payment to job labor represents the direct labor payment out of the original \$100,000,000 value of highway business. In like manner, the \$100,000,000 payment to all labor represents, in effect, the direct labor payment out of the final \$315,602,700 value of total business.

MATERIALS USED AND TYPES OF HIGHWAYS CONSTRUCTED

It is of interest to ascertain the volume and variety of the products processed by the industries engaged in this large business and, in so doing, to indicate the many industrial operations involved in highway production. Table 23 shows these data. Normal unit prices are used to determine the quantities of materials. These are given in appropriate units and are also expressed in tons in order to compute transportation in ton-miles and average haul in miles. The highway share of the average annual production is calculated on a percentage basis and on the basis of long-time production in the several industries. Determination is also made of the number of average establishments required to supply the demand created by each \$100,000,000 expended for highway construction.

TABLE 23.—Value of business and variety of products involved in the expenditure of \$100,000,000 for highway construction

MATERIALS PROCESSED IN INDUSTRIES AND USED IN HIGHWAY CONSTRUCTION

| Industry | Establishments, the total annual production of which is consumed | Percentage of production in all establishments | Raw materials produced | Processed in industry | | | | | | |
|-----------------------------|--|--|------------------------|--|--|-------------------------|---------------------------------------|--------------|------------|--|
| | | | | Establishments, the total annual production of which is consumed | Percentage of production in all establishments | Weight | Quantity | Unit price | | |
| | | | | | | | | | | |
| Number | Percent | Tons | Number | Percent | Tons | 2,104,300,000 ton-miles | \$0.0175 | \$36,824,500 | | |
| Transportation | — | — | 1 railroad | 1.10 | — | 2,104,300,000 ton-miles | \$0.0175 | \$36,824,500 | | |
| Plant and equipment | — | — | 54 plants | .04 | 145,300 | 35,220,000 tons | .49 | 39,700,500 | | |
| Aggregate-quarrying | 630 plants | 7.35 | 35,220,000 | — | — | — | — | — | 13,843,900 | |
| Insurance and taxes | — | — | 17 plants | 10.20 | 2,630,100 | 13,989,800 barrels | 1.37 | 19,166,200 | | |
| Cement | — | — | 3 plants | .53 | 362,600 | 362,600 tons | 46.00 | 16,317,500 | | |
| Iron and steel | — | — | 3 refineries | .48 | 619,800 | 4,366,300 barrels | 1.96 | 8,558,000 | | |
| Petroleum products | 1,900 oil wells | .59 | 3,014,400 | — | 3,014,400 tons | 1.38 | 4,159,900 | | | |
| Coal and coke | 29 mines | .49 | — | — | 252,886,000 kilowatt-hours | .015 | 3,793,300 | | | |
| Power | — | — | 11 plants | — | — | 1,385,600 tons | 3.15 | 4,364,700 | | |
| Metallic-ore mining | 8 mines | 4.56 | 1,385,600 | — | — | 1,385,600 tons | 3.15 | 4,364,700 | | |
| Forestry products | 9,670 acres | .27 | 391,100 | 30 mills | .27 | 169,600 | 101,500 thousand feet, board measure. | 29.60 | 3,003,700 | |
| Advertising and development | — | — | 5 plants | 4.80 | 11,700 | 234,600 hundredweight | 12.90 | 3,333,300 | | |
| Explosives | — | — | 3 plants | .003 | 7,600 | — | — | 3,026,300 | | |
| Laboratory | — | — | do | .68 | 2,800 | 5,619,000 pounds | .38 | 2,078,000 | | |
| Rubber | 6 clay pits | .46 | 173,900 | 6 plants | .46 | 173,900 | 35,800 thousand | 24.00 | 859,800 | |
| Agricultural products | 800 farms | .01 | 42,100 | — | — | 42,100 | 42,100 tons | 67.00 | 2,819,800 | |
| Pipe | — | — | 11 plants | 16.33 | 19,200 | 1,345,400 linear feet | .70 | 941,800 | | |
| Nonferrous-metals refining | — | — | 1 plant | .38 | 6,700 | 6,700 tons | 277.00 | 1,857,400 | | |
| Container | — | — | do | .10 | 4,900 | 9,878,500 pounds | .042 | 414,900 | | |
| Retail trade | — | — | 500 stores | .04 | 23,400 | 23,400 tons | 700.00 | 16,348,000 | | |
| Wholesale trade | — | — | 25 establishments | .01 | 23,400 | — | 422.00 | 9,838,300 | | |
| Manufacturing | — | — | 15 establishments | .01 | 23,400 | — | 213.00 | 4,958,500 | | |
| Total | — | — | 41,001,100 | — | 43,886,500 | — | — | 215,602,700 | | |

| Industry | Used in highway construction | | | | |
|---------------------|------------------------------|-------------------------------------|------------|-------------------|--|
| | Weight | Quantity | Unit price | Value of business | |
| | | | | | |
| | Tons | | | | |
| Transportation | — | 999,700,000 ton-miles | \$0.0175 | \$17,544,100 | |
| Plant and equipment | 32,000 | 63,900,000 pounds | .22 | 14,217,100 | |
| Aggregate-quarrying | 22,968,000 | 22,968,000 tons | .49 | 11,220,300 | |
| Insurance and taxes | — | — | — | 3,133,100 | |
| Cement | 1,961,600 | 10,433,700 barrels | 1.37 | 14,332,600 | |
| Iron and steel | 107,000 | 107,000 tons | 45.00 | 4,811,700 | |
| Petroleum products | 276,800 | 1,980,400 barrels | 2.38 | 4,592,600 | |
| Forestry products | 30,200 | 18,060 thousand feet, board measure | 29.60 | 534,600 | |
| Brick | 19,800 | 4,080 thousand | 24.00 | 97,900 | |
| Pipe | 14,500 | 1,038,600 lineal feet | .70 | 727,500 | |
| Direct wages | — | — | — | 24,391,000 | |
| Reinvestment | — | — | — | 4,397,500 | |
| Total | 25,409,900 | — | — | 100,000,000 | |

TABLE 23.—*Value of business and variety of products involved in the expenditure of \$100,000,000 for highway construction—Continued*
TYPE OF HIGHWAYS CONSTRUCTED¹

| Type | Cost per mile | Surfaced mileage | Projects | Average project expenditure | Total cost |
|--|----------------------|------------------|----------|-----------------------------|--------------|
| | | Miles | Number | | |
| Graded and drained | ² \$4,300 | | 456 | \$42,500 | \$19,387,900 |
| Treated and untreated sand-clay, and untreated gravel | 6,700 | 1,769 | 264 | 44,900 | 11,855,500 |
| Treated gravel, macadam, low-cost bituminous mix, and bituminous macadam | 10,600 | 1,138 | 212 | 56,900 | 12,059,600 |
| Bituminous concrete, portland-cement concrete, and block types | 25,300 | 1,606 | 478 | 85,100 | 40,677,900 |
| Bridges and approaches | 381,400 | 42 | 434 | 36,900 | 16,019,100 |
| Total or average | ² 22,000 | 4,555 | 1,844 | 54,200 | 100,000,000 |

¹ These data are representative of projects approved in the Public Works highway program that included work such as resurfacing of existing roads that served as a base, widening of road surfaces, and projects involving grading, drainage, and surfacing. The costs per mile do not reflect the average cost of constructing 2-lane surfaces on unimproved roads, but rather the cost of constructing surfaces of variable width on both improved and unimproved grades, as reported to the Bureau.

² Cost per surfaced mile.

Table 23 shows that a substantial portion of the materials processed in industry are consumed within the several industries by reason of the transfer of products from some industries as materials to other industries. The balances are materials used in highway construction, where the value of business equals the original expenditure. Table 23 also shows the several types of highways constructed during a typical program involving the general application of funds to both primary and secondary road construction. Details concerning the average allocation of amounts by types, the resulting mileages and average costs are also shown.

Thus table 23 indicates the processes involved in the complete highway industry. The indices derived on the basis of this \$100,000,000 expenditure may be applied readily to a Federal or State program of any size. The analysis is directed to setting forth, in considerable detail, the influence exerted by expenditures for highway improvement on our economic life. Such an analysis should be useful to public officials in formulating highway policy.

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² References such as (18), (35), and (42) are to publications that were used to obtain basic information and background on certain industrial operations, as well as periodic changes in the trends of prices, wages, hours of work, production, and miscellaneous information such as lends itself to inferential use. The use made of these publications was such that specific reference seems unnecessary.

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